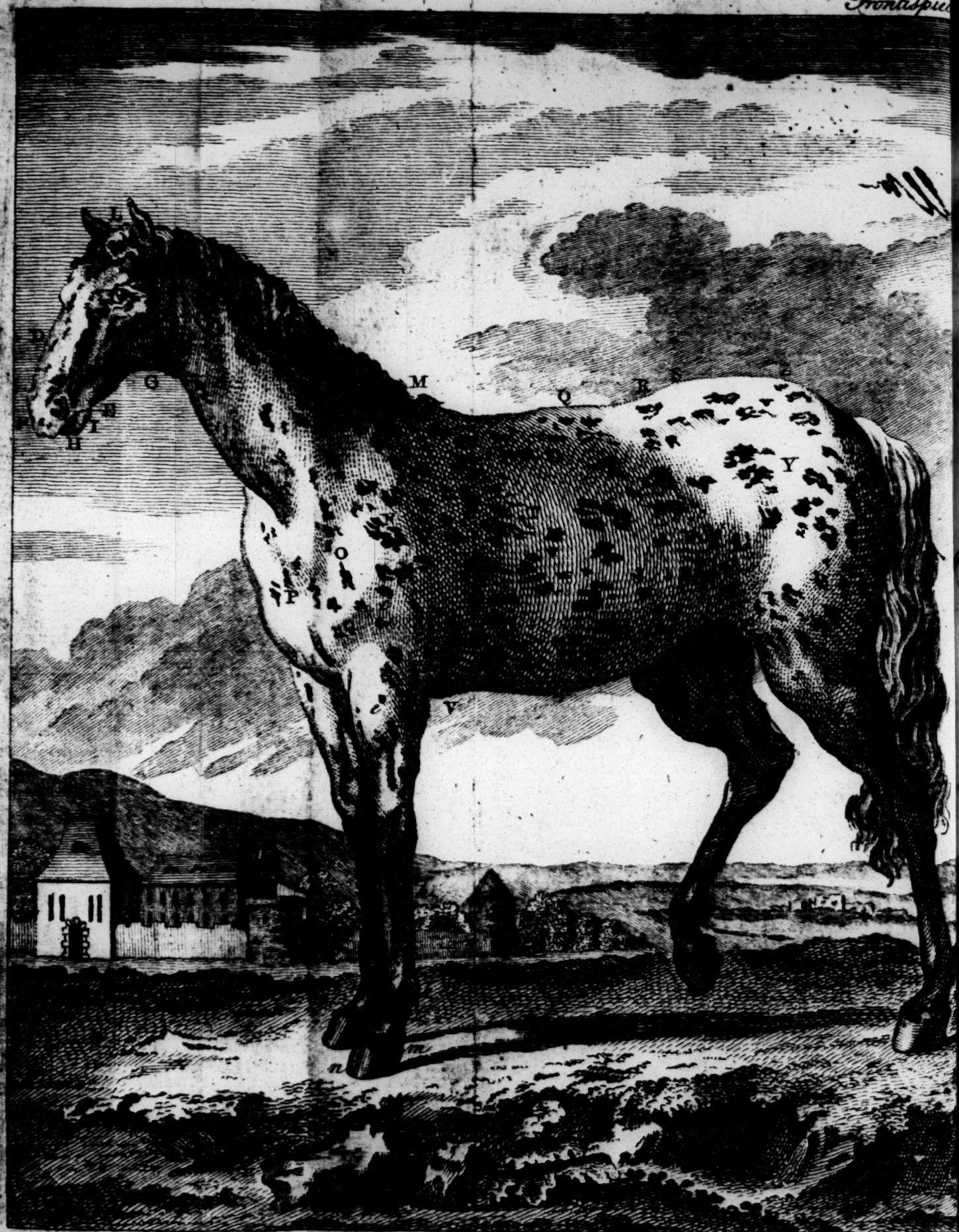
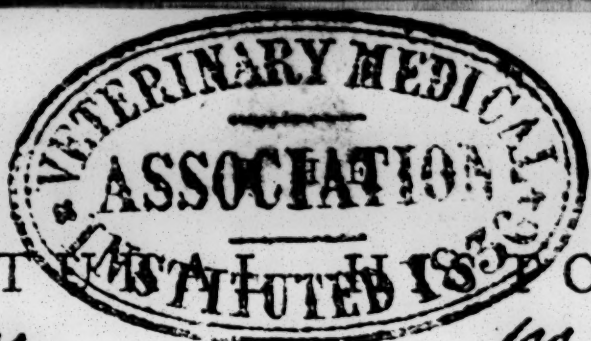




J.B. Oudry pinx.

J. Taylor sculp.



NATURAL HISTORY
Willm OF THE *Moody*
HORSE.

To which is added, that of the

ASS,	✕ ✕	SHEEP,
BULL,	✕ ✕ ✕ ✕	GOAT,
COW,	✕ ✕ ✕ ✕ ✕ ✕	AND
OX,	✕ ✕	SWINE.

Bathampton WITH *Willm*.

ACCURATE DESCRIPTIONS
of their several PARTS.

AND FULL DIRECTIONS FOR
BREEDING, CHUSING, FEEDING, and IMPROVING,
those useful Creatures.

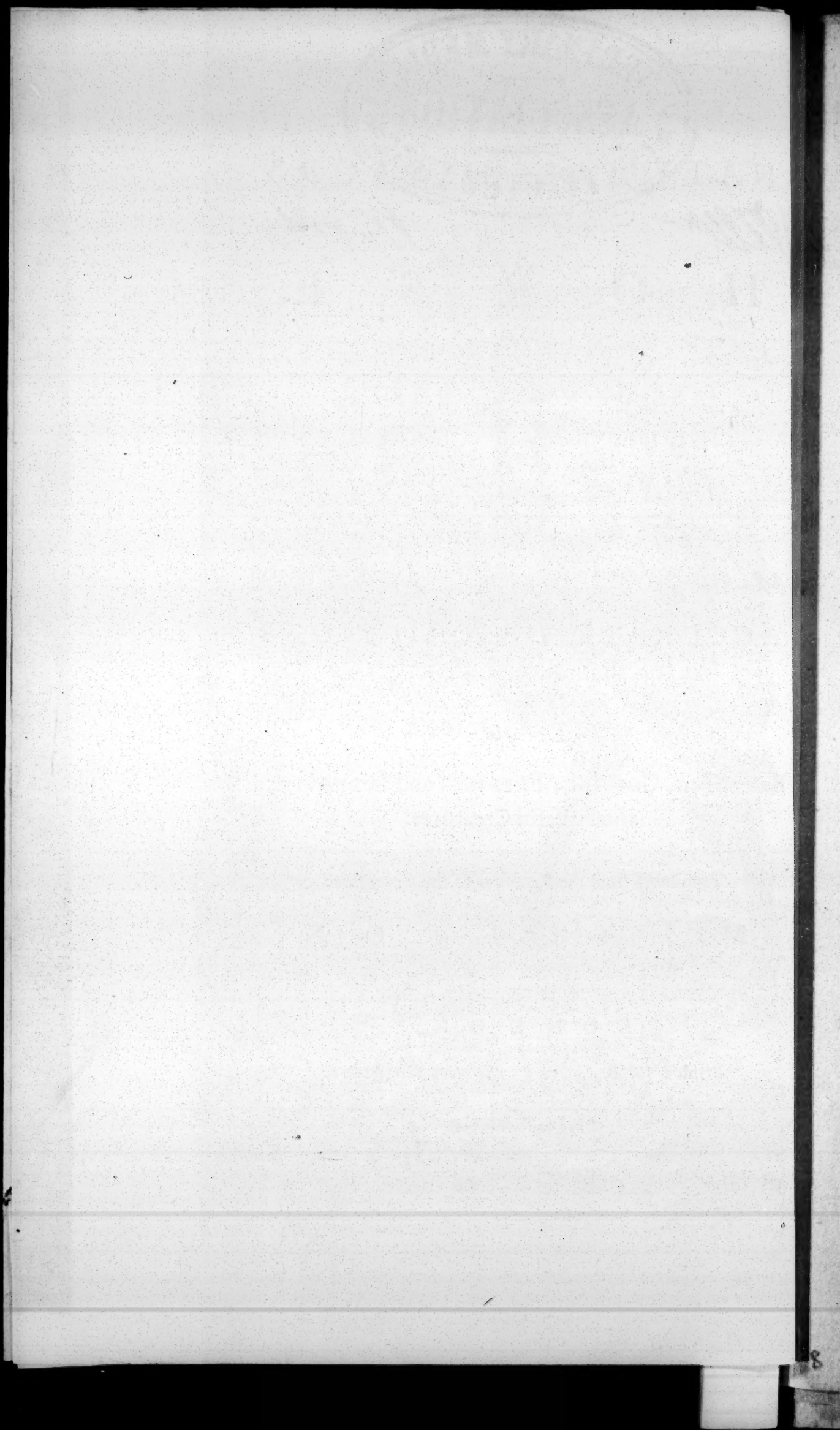
Translated from the FRENCH of the Celebrated

M. de B U F F O N.

L O N D O N :

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M.DCC.LXII.

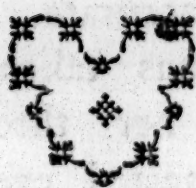


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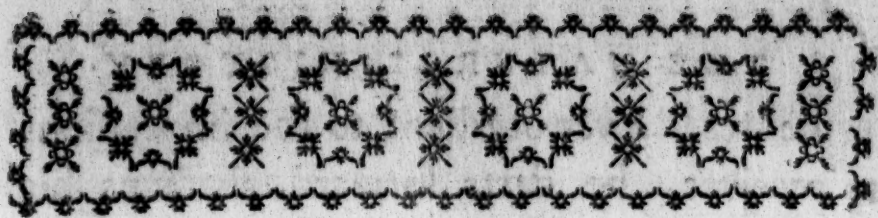
THE Natural History written by M. de BUFFON, whence the following articles are extracted, has been received with the greatest applause in every part of Europe. The articles relating to the different animals are far more extensive and particular, than those of any other author: their nature and properties are fully displayed, and the descriptions of each remarkably particular and accurate. Biassed by no hypothesis, he has taken nature for his guide, followed her thro' her intricate mazes, and delineated every thing as he found it in the animal creation: shewn the manner of breeding, feeding, fattening, and improving the production of each species of animals; and laid down rules for rendering them still more useful to mankind.

But this work is too voluminous to be read, and too expensive to be purchased by the generality of readers. We were therefore persuaded, that if the more useful parts of it were extracted, and published separately, they would meet with a kind reception from the public. Accordingly we have translated the

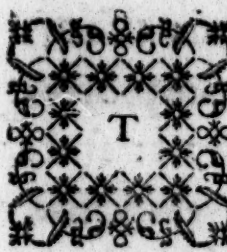
the Natural History of the Horse, the Ass, the Horned Cattle, the Sheep, the Goat, and the Swine; and if this attempt meets with encouragement, we propose to publish some other parts of this admired performance.



THE



THE
NATURAL HISTORY
OF THE
HORSE.

HE most noble conquest ever obtained by man, was over this proud and spirited animal, which shares with him the fatigues of war, and the glories of battle. The Horse, not less intrepid than his master, sees danger, and defies it; he inures himself to the din of arms; he delights in it, seeks it, and is animated with an ardour equal to that of man. He also shares with his master in the pleasures of the chace, the course, and tournaments: but his docility being equal to his courage, he is not carried away by impetuosity; but checks its impulses, and not only submits to the hand of the rider, but seems even willing to consult
B his

2 THE NATURAL HISTORY

his desires. Ever obedient to the impressions he receives, he darts forward, slackens his pace, or stops, as they happen to indicate: he renounces his very being, and exists merely by the will of another; which he frequently anticipates, and by the celerity and precision of his motions, at once expresses and executes. He feels as much as is desired, and performs no more than the rider pleases; he gives himself up without reserve, and declines no service; exerts all his strength, and, that his obedience may be complete, will strain every nerve, till he even expires under his generous efforts.

Such is the horse, whose talents are improved, and his natural qualities perfected by art: from his birth he is carefully attended, exercised, and fitted for the service of man: his education commences with the loss of his liberty, and is completed by restraint. The servitude of these animals is so universal and perpetual, that we seldom see them in their natural state. When employed, they are loaded with harness; in the seasons of rest, they are not entirely free from shackles; and even in the fields and pastures, they carry the badges of slavery, and frequently bear the cruel marks of labour and pain. Their mouths disfigured with furrows, occasioned by the bit; their sides deformed
with

with ulcers or cicatrices from the spur; their hoofs perforated with nails, and their attitudes, by the continued pressures of the harness, cramped and constrained; even those, whose servitude is of the easiest kind, being kept chiefly for shew and magnificence, and whose gilded chains are not so much intended for an ornament to them, as to display the opulence of their master, are still more disgraced by the elegance of their foretop, the plaiting of their manes, the gold and filken caparisons with which they are adorned, than by the iron fastened to their feet.

Nature is more elegant than art; and in an animated being, the freedom of motion constitutes the beauty of nature. Observe those horses in the *American* dominions of *Spain*, where they enjoy all the sweets of liberty; how elegant in their attitudes, their running and leaping! Free from all restraint and stiffness, they are proud of their independence; they fly from man, and disdain his care; they seek and find themselves proper food; they range and frisk at liberty in immense pastures, cropping the fresh product of a perpetual spring. No settled abode, no other shelter than the canopy of a serene sky, they breathe a purer air than in those vaulted palaces where we

confine them in narrow spaces. Accordingly these wild horses excel most of their species in strength, fleetness, and vigour. In them spirit and dignity are the gifts of nature; the others possess only the gifts of art, *viz.* skill and gracefulness.

The nature of these animals is not ferocious, they are only wild and spirited. Though superior in strength, they never molest other animals; and if molested themselves, they despise, disperse, or trample upon the aggressor. They are attached to each other, and herd together; not through fear, but from a natural love of society. Grass and vegetables being all they desire, a sufficiency of food is never wanting; and not being carnivorous, they have no wars either with other animals, or among themselves. They never dispute about subsistence, never contend with one another for prey or booty, the usual causes of quarrels and battles among carnivorous animals. Thus they live in peace; every individual has enough, and their appetites being simple and moderate, they never envy each other.

All these particulars may be observed in young horses brought up together; their dispositions are mild and gentle, the social qualities

ties are seen in them, and their strength and mettle are conspicuous only in acts of emulation. They strive to excel in speed, and to accustom themselves to danger: they defy each other to cross a river, or leap a ditch; and those which, in these natural exercises, set the example, those which voluntarily lead the way, are always the best, the most generous, and often, when tamed, the most docile and tractable.

Some antient authors mention wild horses, and even the places where they were found. *Herodotus* observes, that on the banks of the *Hypanis* in *Scythia*, were wild white horses; and he describes others in the northern parts of *Thrace*, beyond the *Danube*, cloathed with hair five inches in length. *Aristotle* mentions *Syria*; *Pliny*, the northern countries; *Strabo* the *Alps* and *Spain*, as countries that produced wild horses. Among the moderns, *Cardan* says the same of *Scotland* and the *Orkneys*; * *Olaus* of *Muscovy*; *Dapper* of the isle of *Cyprus*, adding, that its wild horses were remarkable for their beauty, swiftness and strength; † *Struys* ‡ of the isle of *May*, where there is a

* Vide *Aldrovand. de Quadrupedib. lib. I. page 19.*

† *Description of the islands of the Archipelago, page 50.*

‡ *Voyages of John Struys, tom. I page 11.*

breed of wild horses extremely small. *Leo Africanus** relates, that wild horses were found in the deserts of *Africa* and *Arabia*; and affirms, that he himself saw, in the wastes of *Numidia*, a white colt with a frizzled mane. *Marmol*† confirms this account, and observes that in the deserts of *Arabia* and *Lybia*, these animals are small, of an ash colour, and some of them white, with short bristled manes; and that neither dogs nor tame horses can equal them in fleetness. The *Lettres Edifiantes* ‡ mention very small wild horses in *China*.

All parts of *Europe* being at present inhabited, and almost equally peopled, wild horses are no longer to be found in it; and those in *America* came originally from tame horses bred in *Europe*, and carried over thither by the *Spaniards*, where they have since multiplied in the vast tracts of that uninhabited country; for this species of animals were wanting in the new world. The amazement and terror of the inhabitants of *Mexico* and *Peru*, at the sight of the horses and the cavalry, sufficiently intimated to the *Spaniards* that the horse was

* *De Africa descriptione*, part II. vol. II. page 750 and 751.

† Vide *l'Afrique de Marmol*. Paris 1667, tom. I. page 50.

‡ Vide *Lettres Edifiantes*, recueil XXVI. page 371.

unknown in these climates, which induced them to transport great numbers both for military service, private convenience, and the propagation of the species. Some they turned loose in different islands, and even on the *Continent*, where they multiplied like other wild animals. Monsieur *de la Salle* *, in the year 1685, saw some of these horses near the bay of *St. Louis*, in *North America*; but so wild that he could not come near them. The author of the adventures of the *Buccaniers* † says, “ that in the island of *St. Domingo*, troops of
 “ above five hundred horses are often seen;
 “ that at the sight of a man they make a general halt, while one of them approaching
 “ within a certain distance, snorts, flies away,
 “ and all the rest follow him.” He adds, that whether these horses have degenerated during their being wild, he cannot pretend to say; but he did not think them so handsome as those of *Spain*, though undoubtedly of that breed.
 “ Their head and legs, he describes, as very
 “ large, the latter full of knots; their ears
 “ and neck long. The inhabitants easily tame
 “ them for their several employments, and the
 “ hunters load them with their hides. They

* See the last discoveries in *North America*, made by *M. de la Salle*.

† See the history of the *Buccaniers*.

8 THE NATURAL HISTORY

“ are taken in toils, laid in places where they
 “ frequent, are easily entangled, and if by the
 “ neck, strangle themselves, unless some per-
 “ son happens to be ready to assist them. They
 “ are fastened round the body and legs to
 “ trees, and there left two days without either
 “ meat or drink. This renders them tame,
 “ and in time they become as tractable as if
 “ they had never been wild: and if they
 “ should by accident recover their liberty,
 “ they never regain their former wildness,
 “ but know their masters, and quietly suffer
 “ themselves to be re-taken.” *

* M. de Garfaut has given another method for taming wild horses. “ Colts that have not been broke while very
 “ young, are often so fearful of the approach and touch of
 “ a man, that they bite and kick in such a manner, as ren-
 “ ders it almost impossible to bleed or shoe them. But if
 “ they are not to be managed by patience and mildness, re-
 “ course must be had to the method used in falconry, for
 “ taming a bird newly taken, and intended to be fitted for
 “ flight; and this is by not suffering him to sleep till he falls
 “ down with weakness. So likewise a wild horse must be
 “ fastened with his hind parts to the manger, and a man
 “ stand day and night at his head, to give him from time to
 “ time a handful of hay, and hinder him from lying down.
 “ It is surprizing to see how suddenly the generality of
 “ horses will be tamed by this method; though the ob-
 “ stinacy of some is such, that they must be watched in
 “ this manner for a week or more.” Vide *la nouvelle parfait*
Maréchal, page 89.

This

This demonstrates, that these animals, naturally mild, are very much inclined to become familiar with man, and attach themselves to him. Accordingly, none of them are ever seen to leave our dwellings for the forests and desarts; but, on the contrary, express the greatest desire of returning to their stables; though all they meet with there is a gross food, always the same, and generally measured out rather by parsimony than their craving appetites; but the kind treatment they meet with compensates for their other losses. When spent with fatigue, the place of rest is a place of delight; they smell it from afar; they find it out in the midst of the most crowded cities, and seem in every thing to prefer servitude to freedom. The habits they have contracted become a kind of second nature; horses left in the woods having been known to keep a continual neighing, in order to be heard; and at the voice of a man, have ran to him with transport; and amidst a rich variety of agreeable nourishment, while deprived of human society, they have been known to lose their flesh, and to become strangely emaciated in a very short time.

Thus education gives the whole turn to their manners; and this education requires an assiduity, care, and attention, that man will not bestow

bestow on any other creature; but the continual services of the horse make him ample amends. Foals are separated from their dams after five, six, or at farthest seven months; experience having shewn, that such as are suffered to suck ten or eleven months, though usually larger, and fuller of flesh, are not equal in other respects to those that are taken away sooner. After living six or seven months on milk, they are habituated to a more solid nourishment, having bran given them twice a day, with a small quantity of hay, which is increased as they advance in age; and in this manner they are kept in the stable, as long as they express any desire of returning to their dam: but when this uneasiness is over, they are turned into the fields, taking care never to do it fasting. An hour before they are turned to grass the bran must be given them, and also some water; nor must they be exposed either to severe cold or rain: in this manner the first winter must be passed. In the *May* following they must not only be turned into the field every day, but may lie in the open air till the end of *October*, taking care that they do not feed on the after-math; for by accustoming themselves to this remarkably delicate and succulent grass, they would contract a dislike to hay,

hay, which, together with bran mixed with barley and oats ground, is to be their principal food during the second winter. In this manner they are to be kept till their fourth year, spending the day only in the pastures during the winter; but both day and night in the summer. When they reach that age, they are taken from the pastures, and fed with dry meat; but in this change of diet some precautions is expedient; as during the first week to feed them only with straw, and to give them proper medicines against worms, which often trouble them, from bad digestions and too rank grass. This practice, recommended by M. de Garfaut,* is doubtless founded on experience; nevertheless it is evident that at all ages, and in every season, these animals are not exempt from worms: their stomachs are crammed with such a prodigious quantity, that they seem to form a part of their constitution. We have found them equally in healthy and sick horses; in such as feed on grass, and in such as eat only hay and oats. Nay, even the stomach of the ass, which of all creatures approaches nearest to the horse, has also prodigious quantities of worms, without giving the creature the least uneasi-

* V. le nouveau parfait *Maréchal*, par M. de Garfaut. Paris 1746, page 84 and 85.

ness. Thus worms, at least those we mention, are not to be considered as an accidental distemper, caused by feeding on a harsh rank grass, but rather as an effect depending on the food and common digestion of those animals.

At weaning young colts, they should be kept in a clean stable, not over warm, which would render them tender, and too sensible of the impressions of the air: they must frequently have fresh litter, and be rubbed often with straw; but not tied nor curried till they are three, or at least two years and a half old; for the roughness of this friction would give them pain, and their skin being too tender to endure it, instead of thriving, they would fall away. The rack and manger should not be too high, lest the necessity of lifting up their heads to reach the food, should accustom them to carry their heads in that manner, which would spoil their chests. When they are a year, or a year and a half old, the hair on their tails should be cut, as the succeeding growth will be stronger and thicker than the former. When they are two years old, they should be separated, the stone colts to be kept with the horses, and the fillies with the mares; otherwise the former would fruitlessly weaken themselves with the latter. At the age of three years,

years, or three and a half, they should be broke and rendered docile. In order to this, a light easy saddle should be put on their backs, and continue there two or three hours every day. They are also to be used to receive the bit of a snaffle bridle into their mouths, and suffer their feet to be taken up, and some strokes given on the sole, as if shoeing them. If they are designed for draught horses, a harness is to be put on their bodies, together with a snaffle bridle; but at first no bridle is to be used. Afterwards they should be trotted on the level ground, with a cavesson on the nose, but without a rider, the groom only holding the rein, and either the saddle or harness on their backs. And when a saddle horse easily turns, and freely comes up to him who holds the rein, he should mount on his back, and immediately dismount, without riding him till he is four years old; as before that time the weight would be too much for him. But at four years old he may be ridden, and trotted at small intervals.*

When a coach-horse is accustomed to the harness, he is to be put into the carriage with another trained horse, and to be led by a long

* See the Elements of Cavalry, by M. de la Guerinie.
Paris, 1741, tom. I. page 140 & seq.

rein,

rein, till he begins to draw properly; when the coachman is to begin to teach him to back, being assisted by a man, who standing directly before him, is to push him gently backward, and even give him a few stripes, that he may obtain it the sooner, and with more ease. All this is to be done before the young horses have changed their food to oats and straw; for they grow more headstrong and difficult to break, in proportion as they increase in vigour.*

The bit and the spur are two methods contrived for obliging them to comply with their master's intention; the former for rendering their motions exact, and the latter for increasing their swiftness. The mouth seems to be appointed by nature for no other impressions than those of taste and appetite; yet such is its sensibility in the horse, that the indications of the rider's will are communicated by it better than by the eye or ear; the least motion, the slightest pressure of the bridle, is sufficient to give notice to, and direct the animal; and the only fault in this organ of sensation is its very perfection, its remarkable sensibility; which must be regarded; for, if abused, the

* V. le nouveau parfait *Maréchal*, par M. de Garfaut, page 86.

horse's mouth is spoilt, and becomes insensible to the impressions of the bit. The sight or hearing could not be subject to any such damage, nor be dulled in this manner: but probably inconveniencies have been found in directing horses by these organs; and, indeed, signs transmitted by the touch, have a much greater effect on animals in general, than those communicated either by the eye or ear. Beside, the situation of the horse with regard to the rider, or the person who guides him, renders the eyes of little or no use in that intention, the horse seeing only strait before him; and in order to perceive any signs made by the rider, it would be necessary for him to turn his head; and though the ear be an organ by which the horse is often encouraged and directed, yet the use of it seems almost wholly limited to those which have not been properly broke; for at the riding-house they do not speak to them. In short, when a horse is well broke, the least pressure of the thighs, the slightest motion of the bit, directs him; the spur is of no use, or at least only to excite him to violent motions; and when an unskilful rider spurs his horse, and at the same time keeps a tight rein, the creature finding himself excited by the one, and checked by the other, he necessarily rears up,

up, without stirring from his place. By the bridle an advantageous and noble air is given to the horse's head, it is placed in a proper position; and at the smallest sign or motion of the rider, the horse takes his different paces. The most natural of all paces is perhaps the trot; but the walk and gallop are much easier to the rider: these are also the two motions in which most pains are required to render a horse perfect. When he lifts up the fore-foot to walk, the motion must be equally bold and easy, and the knee properly bent; the leg which is lifted up must appear steady; and, when set on the ground, firm; bearing equally in all parts: nor must the horse's head be at all affected with the motion; for if the leg falls to the ground suddenly, and at the same time the head sinks, it is commonly done to give relief to the other leg, as not able alone to bear the whole weight of the body. This is a very great fault, as well as to carry the foot too much out or in, as it falls on the ground in the same manner. Let it also be observed, that bearing on the heel denotes weakness; and on the toe, a forced and tiresome attitude, which he cannot bear for any long time.

The walk, though the slowest of all his paces, must be quick; neither too wide, nor

too contracted, and the horse must carry himself easy, which greatly depends on the freedom of his shoulders, and is perceivable in the manner of carrying his head; if that be high and firm, it is an indication of strength and freedom. When the motion of the shoulders is not sufficiently free, the leg is not lifted high enough, and the horse is subject to stumble, and trip with his foot against the inequalities of the ground; and, when the shoulders are still more freightend, so that the legs seem to have no connection with them, the horse soon tires, frequently falls, and is fit for no service. A horse should be firm on his haunches; that is, he should in walking raise the shoulder, and lower the haunch. He should also support his leg, and lift it to a proper height; but if he supports it too long, or drops it too slowly, he loses all the advantages of ease, becomes stiff, and is fit only for some ostentatious parade.

The motions of a horse should not only be easy, but at the same time equal and uniform, both before and behind; for if the haunches stagger while the shoulders remain firm, the rider is incommoded by a jolting motion. The same thing happens when the horse moves his hind-leg too far forwards, and places it be-

fore the track of the fore-foot. Short bodied horses are subject to this fault; those which cut, or strike their legs against each other, are not sure footed; and, in general, a long-bodied horse is most easy to the rider, as being at a greater distance from the two centers of motion, the shoulders and haunches, he is consequently less susceptible of their jolts and impressions.

Quadrupeds usually walk by moving one of the fore and hind legs forward at the same time. The very instant that the fore off-leg is lifted up, the hind near-leg is also moved; and this step being finished, the near fore leg moves in conjunction with the off hind one; and so on alternately. As their bodies bear on four resting points, forming an oblong square, the most commodious manner of motion is a diagonal change of two of them at once; so that the center of gravity of the animal's body may have but a small motion, and always remain nearly in the line connecting the two resting points that are not in motion in the three natural paces of the horse, the walk, the trot, and the gallop; this rule of motion is always observed, but with some difference. In the walk there are four beats in the motion; if the off fore leg moves first, the near hind
leg

leg follows instantly after ; then the near fore leg moves in its turn to be immediately followed by the off hind leg. Thus the off fore foot touches the ground first, the near hind foot second, the near fore foot third, and the off hind foot the last, which forms a movement of four beats, and three intervals, of which the first and last are shorter than the other. In the trot, there are only two beats in the motion ; if the off fore leg moves first, the near hind leg moves at the same time, without the least interval between them ; then the near fore and off hind leg move also at the same time : so that this motion of the trot has but two beats, and one interval : the off fore and the near hind feet lighting together on the ground ; the near fore foot and off hind foot are also on the ground at the same time.

In the gallop, there are usually three beats ; but as in this motion, which is a kind of leap, the fore parts do not immediately move of themselves, but are driven by the force of the haunches and hinder parts, if the off fore foot is to stretch beyond the near, the near hind foot must be grounded first, to serve as a fulcrum to this springing motion. Thus it is that the near hind foot makes the first beat of the motion, and also touches the ground first ;

then the off hind leg raises itself jointly with the near fore leg, and they both touch the ground again at the same time; and lastly, the off fore leg, which moved an instant after the near fore and off hinder legs, touches the ground the last, which makes the third beat. In the gallop, there are therefore three beats, and two intervals; and in the first of these intervals, when the motion is performed with rapidity, there is an instant when all the four legs are off the ground, and the horses four shoes are seen at the same time. When a horse has supple haunches and hocks, and moves them with swiftness and agility, the motion of the gallop is more complete, and the cadence made at four times. First, he grounds the near hind foot, which denotes the first beat; next the off hind foot touches the ground, and denotes the second beat; the near fore foot grounding an instant after, denotes the third beat; and lastly, the off fore foot, which touches the ground the last, denotes the fourth beat.

Horses usually gallop with the off-foot, in the same manner as they use the same leg in the walk or trot; they also gain ground in galloping by the off fore leg, which advances farther than the near, and thus the off hind leg, which immediately follows the off fore leg,

leg, also advances beyond the near hind leg, and this is constantly done while the gallop continues; the result of which is, that the near leg supporting the whole weight, and pushing forward, the other is the most fatigued; so that it would be proper to exercise horses to gallop alternately on the near and off leg; for, by this means, they will hold out longer in this violent motion, and this is accordingly done at the riding-school; but, perhaps, on another account, that as they are often made to shift hands, that is, to describe a circle, the center of which is sometimes on the off, sometimes on the near side, they are also taught to gallop sometimes on the off, sometimes on the near leg.

In the walk, the horse lifts his legs but a small height, so that his feet nearly touch the ground. In a trot they are raised higher, and the feet are entirely off the ground. In a gallop they are raised still higher, and the feet seem to rebound from the turf. In a walk it is required that the motion be quick, free, easy, and steady. The trot must be firm, quick and equal, the hinder impelling the fore parts, and, at the same time, the horse must carry his head up, and his body strait; for if the haunches rise and fall alternately at every motion of the trot, and the horse vacillates, he trots ill from weakness: if he throws out his

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In the walk, the horse lifts his legs but a small height, so that his feet nearly touch the ground. In a trot they are raised higher, and the feet are entirely off the ground. In a gallop they are raised still higher, and the feet seem to rebound from the turf. In a walk it is required that the motion be quick, free, easy, and steady. The trot must be firm, quick and equal, the hinder impelling the fore parts, and, at the same time, the horse must carry his head up, and his body strait; for if the haunches rise and fall alternately at every motion of the trot, and the horse vacillates, he trots ill from weakness: if he throws out his

fore legs, it is also a defect; for the fore legs should always be on a line with the hinder, and cover them. When one of the hind legs throws itself forward, if the fore leg of the same side remains a little too long in its place, the resistance gives an uneasiness to the motions; and for this reason it is that the interval between the two beats in the trot should be short; but however short it be, by this resistance alone, the trot becomes more uneasy than the walk, or the gallop; in walking the motion is more easy and pleasing, because the resistance is less. In the gallop, there is scarce any horizontal resistance which alone is troublesome to the rider; the re-action of the motion of the fore legs being almost entirely upwards in a perpendicular direction.

The spring of the hocks has no less share in the motion of the gallop than that of the loins; while the loins exert themselves in raising and impelling forward the anterior parts; the muscle of the hocks, by its spring, breaks the impetus, softens the shock, and the gallop is easy in proportion, as this spring of the hocks is easy and supple; it is also fleet and rapid in proportion to the strength of the muscles of the hocks; and the more equal, the more the horse bears on his haunches; and the shoulders are supported by the muscles of
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the loins. Let it be observed, that horses, which in a gallop lift the fore legs to an unusual height, are not the fleetest; for they strike shorter, and at the same time tire themselves sooner; this usually proceeds from a want of freedom in the shoulders. The walk, the trot, and the gallop, are the most common and natural paces; but some horses have another, which is called the amble. It is very different from the three others, and at first sight appears contrary to the laws of mechanism; the motion is not so swift as the gallop, or even the trot. In this pace, the horse's feet move still nearer the ground than in the walk, and are more extended: but what is most singular in it is, that the two legs of the same side, for instance, the the off hind and fore leg, move at the same time; and then the two near legs, in making another step, move at once; and in this alternate manner the motion is performed. So that the two sides of the body are alternately without support, or any equilibrium between the one and the other, which must necessarily prove very fatiguing to the horse, being obliged to support himself in a forced oscillation, by the rapidity of a motion, in which his feet are scarcely off the ground. For if in the amble he lifted up his feet as in the trot, or even in a

walk, the oscillation would be such, that he could not avoid falling on his side; and it is only by keeping his feet so very near the ground, and by the quick alternate motion, that he supports himself in this pace, in which the hind leg is not only to move at the same time with the fore leg of the same side, but to gain on it, or touch the ground a foot, or foot and an half, beyond the spot where the latter grounded. The further the hind leg extends beyond the place where the fore leg grounded, the better the horse ambles, and the more rapid is the whole motion. Thus in the motion of the amble, as in the trot, there are only two beats; and the whole difference is, that in the trot the two legs moving together, are in a diagonal position; whereas in the amble the two legs of the same side move together. This pace, which is very fatiguing to the horse, and which he must never do but upon even ground, is very easy to the rider. It has not the roughness of the trot, which is caused by the resistance of the fore leg, at the lifting up of the hind; because in the amble this fore leg is lifted up at the same time as the hind leg of the same side: whereas in the trot the fore leg of the same side is at rest, and resists the impulse during the whole
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time that the hinder leg is in motion. They who are skilled in horsemanship tell us, that horses, which naturally amble, never trot; and that they are a great deal weaker than others. Colts, indeed, very often perform this pace, especially when they exert themselves, and are not strong enough to trot or gallop. Most good horses, which have been over-worked, and on the decline, are also observed voluntarily to amble, when forced to a motion swifter than the * walk.

Thus the amble may be considered as a defective pace, not being common; and natural only to a very few horses, which, in general, are weaker than others. And such amblers as seem the strongest, are spoiled sooner than those which trot or gallop. But there are still two other paces, which weak, or over-worked horses take to of themselves, and are much more faulty than the amble. These, from their defects, have been called broken, disunited, or compound paces. The first is between the walk and the amble; and the second between the trot and gallop; both are the effects of long fatigue, or great weakness in the loins. Horses used to carry mails, by being frequently

* See l'Ecole de cavalerie de M. de la Guérinière. Paris 1751, in folio, page 77.

over-loaded, on their decline take to the former, instead of the trot; and spoiled post-horses, when urged to the gallop, go into the latter.

The horse is, of all animals, the only creature of a large size that has a proportional elegance in the several parts of his body, as will fully appear, if compared with the animals immediately above or below him. The ass is ill shaped; the lion's head is too large; the ox's legs too slender, and short in proportion to the bigness of his body. As for the camel, he is remarkably deformed. With regard to the larger animals, as the rhinoceros and elephant, they seem, as it were, shapeless masses. The great length of the mandibles is the principal cause of the difference between the head of quadrupeds and that of man; and at the same time the most ignoble mark. Yet, though the mandibles of a horse are of a considerable length, he has not, like the ass, an air of simplicity, nor like the ox, that of stupidity.

On the contrary, the regularity of the proportions of his head gives him an air of sprightliness, to which the beauty of his chest is a great addition. The horse seems desirous of raising himself above the class of quadrupeds,

by lifting up his head. In this noble attitude he views his master face to face: his eyes are vivid and very open; his ears well shaped, and of a proper size; not short like those of the bull, nor over long like those of the ass: his mane is a fine ornament, renders his neck graceful, and gives him an air of vigour and spirit: his long bushy tail covers and terminates the extremity of his body with remarkable beauty; very different from the short tail of the deer, the elephant, &c. and from the bare dock of the ass, the camel, and the rhinoceros. The horse's tail is composed of long thick hairs, which seem to issue from the croup; the dock from which they really come being very short. He cannot, like the lion, erect his tail; and indeed its natural position, though pendent, better becomes him: and as he has the command of it in a horizontal direction, he uses it for driving away the flies: for though his skin be remarkably compact, and every where furnished with a close and thick hair, yet it is very sensible. The attitude of the head and neck contributes, more than any other part of the body, to give the horse a noble carriage. The upper part of the crest, where the mane issues, nearest the withers, should at first rise in a straight line; and

and afterwards, as it approaches near the head, form a curve nearly resembling that of the swan's neck. The lower part of the neck should not form a curve, its proper direction being in a right line from the chest to the lower jaw, a little inclining forward, a perpendicular direction would render the shape of the neck faulty; the upper part of the neck must also be slender, and thin of flesh towards the mane, which should be composed of long fine hair, but not too thick. The neck must be long and raised, but proportioned to the height of the animal: when too large and slender, the horse is apt to toss his head, and when too short and fleshy, heavy on the hand. The most graceful position of the head is when the face is perpendicular to the horizon.

The head must be lean and slender, but not too long; the ears at a proper distance from each other, small, erect, and without motion, narrow, thin, and well placed on the top of the head; the forehead narrow, the eye-pits filled; the eye-lids thin; the eyes clear, brisk, and full of fire, rather large than small, and projecting to a level with the head; the eye-balls large; the under jaw bare of flesh and not thick; the nose a little arched; the nostrils large and open; the partition between
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the two nostrils small; the lips thin; the mouth of a middling size; the withers raised and sharp; the shoulders thin, flat, and not confined; the back equal, smooth, and forming a small convexity during its whole length, and rising on both sides of the back bone, which should appear a little sunk down; the flanks full and short; the croup round and full; the haunches plump; the dock, or fleshy part of the tail thick and firm; the arms and thighs thick and fleshy; the knee round before; the ham large and rounded; the shank sharp before, and large on the sides; the sinew well detached, the pastern joint slender; the fetlock thinly garnished with hair; the pastern large and of a middling length; the coronet a little raised; the hoof black, smooth, and shining; the instep high; the quarters round; the heels broad, and something raised; the frog small and thin; the sole thick and concave.

But all these perfections are united in very few horses. The eyes are subject to several defects, which are sometimes very difficult to discover. Two or three foot-coloured spots appear above the ball, through the cornea of a sound eye; but these spots cannot be discerned unless the cornea be clear, pure, and transparent.

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transparent. Its appearing double, or of a bad colour, is a sure sign that the eye is not good. If the ball of the eye be small, long, and narrow, surrounded with a white ring, or of a greenish blue colour, the eye may be concluded bad, and the sight indifferent.

But I shall defer a particular enumeration of the defects of a horse, till I come to describe his several parts, and only add here a few remarks, by which the perfections and imperfections of a horse may be known. With regard to the temper and present condition of the animal, the motion of his ears is a pretty sure indication. When he is travelling, the tip of his ears should be forward; for a horse when tired flags his ears; and such as are vicious and spiteful, carry one ear forward, and the other backward alternately: all direct their ears towards the place where they hear any noise; and when struck on the back or the croup, they turn them backwards. Horses, with eyes sunk in their sockets, or one of the balls smaller than the other, have generally a bad sight. Those whose mouths are dry, are not of so good a constitution as those that are cool, and froth with the bit. A saddle horse should have flat shoulders, pliable and thin; but a draught horse, large, round, and fleshy.

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Too great a leanness, however, in the shoulders of a saddle horse, when the bones seem to project too much under the skin, is a fault, and indicates that the shoulders want freedom, and consequently that the horse cannot endure any great fatigue. Another defect in the saddle horse is, to have his breast projecting and hanging over, and his legs placed backwards; because in galloping he rests heavily on the hand, and is very subject to stumble and fall. The length of the legs should be proportioned to the stature of the horse; when the fore legs are too long, he is not sure footed; and when too short, heavy on the hand. It has been observed, that mares are more subject than horses to be low forwards; and that stone-horses have larger necks than mares and geldings. One of the most important things to know is the horse's age. In old horses, the eye-pits are generally deep; but this is only an equivocal mark, being also found in young horses begot by old stallions. The most certain knowledge of the age is to be obtained from the teeth, of which a horse has forty, twenty-four grinders, or double teeth, four tusks, and twelve fore teeth: mares have no tusks, or at least very short ones. It is not from the grinders that we know the age; it is dis-

discovered first by the fore teeth, and afterwards by the tushes. The twelve fore teeth begin to shoot within twelve days after the colt is foaled. These first, or foal teeth, are round, short, not very solid, and are cast at different times, to be replaced by others. At the age of two years and a half, the four middle fore teeth are cast, two in the upper jaw, and two in the lower. In one year more, four others drop out, one on each side of the former, which are already replaced. When he is about four years and a half old, he sheds four others, and always next to those which have fallen out and been replaced. These four foal teeth are replaced by four others, but are far from growing so fast as those which replaced the eight former, and are called the corner teeth; they replace the four last foal teeth, and by these the age of a horse is discovered. They are easily known, being the third both above and below, counting from the middle of the jaw. They are hollow, and have a black mark in their cavity. When the horse is four years and a half old, they are scarce visible above the gum, and the cavity is very sensible: at six and a half they begin to fill, and the mark continually diminishes and contracts till seven or eight years, when the cavity

vity is quite filled up, and the black spot effaced; after eight years these teeth ceasing to afford any knowledge of the age, it is judged of by the tushes, which are four teeth adjoining to those last mentioned; and, like the grinders, are not preceded by any other teeth. The two in the lower jaw usually begin to shoot at three years and a half, and those of the upper jaw at four; continuing very sharp pointed till six. At ten the upper seem blunted, worn out, and long, the gum contracting itself as its years increase; the barer therefore they are the older is the horse. From ten to thirteen, or fourteen years, little can be seen to indicate the age; but at that time some hairs of the eye-brows begin to turn grey. This mark, however, is equivocal, like that drawn from the depth of the eye-pits; horses from old stallions, or mares, having grey hairs in the eye-brows, when they are not above nine or ten years old. In some horses the teeth are of such a hardness as not to wear, and in such the black mark always subsists, being never effaced by time; but the age of these horses, which are called *Beguts* by the *French*, is easily known, the hollow of the tooth being filled up, and at the same time the tushes very long. It has been farther observed, that

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this is more common in mares than in horses. The age of a horse may be also known, tho' less accurately, by the bars in his mouth, which wear away as he advances in years.

At the early age of two years, or two years and an half, this animal is capable of engendering, especially the female: but the foals, got by such young horses, are either faulty in their shape or constitution. A draught, or common horse, should at least be four years old, or four years and an half, before he is suffered to approach the mares; but those of a more slender and delicate nature, should not be admitted to a mare till they are at least six years old; and the fine *Spanish* stallions not till seven: mares may be a year younger. Their time of heat is generally in the spring, from the end of *March* to the end of *June*; but the most violent heat seldom lasts above a fortnight or three weeks; and this is the time when they must be led to the horse. The stallion should be handsome, well limbed, with a stately chest, vigorous, sound in every part, and of a good race and country; for if fine stallions be wanting, we cannot expect well shaped horses. The *Arabian*, *Turkish*, *Barb* and *Andalusian* stallions are generally preferred; and in the want of these, fine *English* horses,

horses, who owe their origin to the former, and do not soon degenerate, because of the excellency of the provender. The stallions of *Italy*, especially the *Neapolitan*, are also very good; getting fine limbed saddle horses, when with mares of that make; and excellent coach horses, with strong well set mares. It is said, that in *France* and *England*, &c. the *Arabians* and *Barbs* usually get horses larger than themselves; whereas the foals of *Spanish* horses in the same countries are always smaller. The finest coach horses are bred from the stallions of *Naples*, *Denmark*, or some parts of *Germany* and *Holland*, as *Holstein* and *Friezland*. Stallions must be of a proper size; that is, fourteen hands one or two inches, for saddle horses; and at least fifteen hands for coach horses. A stallion must also be of a good colour, as a jet black, a fine grey, a bay, a sorrel, a bright chesnut, with the mules list; the manes and extremities black; for all horses of a dull or faint colour, together with those whose extremities are white, should be excluded from studs. But it is not sufficient that a stallion has all the external beauties, he should likewise have all the good qualities; as courage, docility, mettle, spirit, agility, a

fenfible mouth, freedom in the foulders, a fure foot, a fuppleneſs in his haunches, a facility of motion in all parts of his body, and eſpecially in the hams. It is alſo proper that he ſhould have gone through ſome of the diſcipline of the riding ſchool. The horſe, of all animals has been the moſt attended to; and, it is obſerved, that in generation, he communicates almoſt every good quality, whether natural or acquired. A horſe naturally vicious, ſkittish, reſtive, &c. produces foals with the ſame diſagreeable qualities: and as the conſtitutional faults, and the vices of the juices are more certainly perpetuated than the qualities of the temper, great care muſt be taken to exclude from the ſtud every defective horſe, whether ill-ſhaped, moon-eyed, having the glanders, palfy, &c.

In theſe climates the mare contributes leſs than the ſtallion to the beauty of the foal; but, perhaps, more to its diſpoſition and ſhape. So that the mares ſhould have a large carcass, be pretty full bellied, and good nurſes. The *Spaniſh* and *Italian* mares are generally preferred for breeding ſaddle horſes: and for coach horſes, thoſe of *England* and *Normandy*. However, with fine ſtallions, fine horſes may be expected from mares of all countries; provided

vided they are well shaped, and of a good breed; for if they were got by a bad horse, their foals will often turn out very indifferent. In these animals, as in the human species, the offspring often resemble the progenitors; but in horses the female does not appear to contribute so much to generation as in the human species. A son is much oftener like his mother, than a foal is like its dam: and when a resemblance happens between the foal and the mare, it is generally in the forehead, the head, and the neck.

Besides, it is necessary, in order to judge rightly of the resemblance between children and parents, that the comparison between them be not made in their first years; we should wait till age has displayed the whole form, when the comparison will be more sensible and striking. Exclusive of the alterations in the form, proportions, and colour of the hair during the time of growth, a quick and sudden change happens at the age of puberty; when the features, the shape, the attitude of the legs, &c. frequently change. The face is lengthened, the nose becomes larger, the jaw projects, or grows thicker; the shape rises or bends; the legs lengthen, and often become crooked, or smaller; so that the physiognomy,

and the appearance of the body are so greatly changed, that the person with whom we might have been well acquainted before the age of puberty, but have not seen till some time after that period, is not easily recollected, at least, not immediately. The resemblance therefore of a child to his parent cannot, with any precision, be determined till after the age of puberty, when it is found by experience, that, in the human species, the son often resembles his father, and the daughter her mother; though there is more commonly a joint resemblance of both: sometimes, indeed, they resemble their grandfathers or grandmothers: nor is it uncommon for them to resemble even their uncles and aunts. It is also observed, that children of the same parents generally resemble each other more than they do their progenitors; and that all have something in common, or a family likeness. In horses, as the male contributes more to generation than the female, mares often bring foals which resemble the stallion in every particular; or at least always more than they do their dam. Some shall resemble their grandsires, and if the dam were herself engendered by a bad horse, it too often happens, that though she be herself beautiful, and had a handsome stallion,
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her foal, however apparently well shaped, when young, will decline in its growth; whilst a mare of a good breed shall produce foals, which, though at first of an unpromising appearance, will improve with age.

These observations on the productions of mares however they may seem to concur in proving, that among horses the male has a much greater share in generation than the female, do not appear to me sufficient to place the fact beyond doubt and exception. It is not impossible but these observations may be just, notwithstanding mares in general may have an equal share in the work of generation. It is not at all strange to me, that stallions, which are always selected from a great number of horses, often natives of hot countries, plentifully fed, and brought up with the greatest care, should contribute more to the work of generation than common mares, foaled in a cold climate, and often employed in hard labour: and as in all the observations made on studs of horses, the stallion has constantly a superiority over the mare; it may very naturally be imagined that the effect is solely owing to this single cause. But, at the same time, it may be equally true, that if very fine mares, from hot countries, were put to ordi-

nary horses, they would have a much greater influence on the foal than the stallion. And that, in general, if no superiority existed on either side, the influence of the male and female, on their offspring, would, like that of the human species, be equal. This to me appears very natural; and what tends to confirm it is, a general observation made on studs of horses, that the number of colts and fillies foaled is nearly equal; which proves that the mare has, with regard to the sex at least, an equal influence.

But here let us leave these enquiries, as they will carry us too far from the subject. When the stallion is chosen, and all the mares intended for him are collected together, there must be another stone-horse, to discover which of the mares are in heat; and, at the same time, contribute to inflame them. All the mares are to be brought successively to this stone-horse, which should also be enflamed, and suffered frequently to neigh. As he is for leaping every one, such as are not in heat keep him off, whilst those which are so suffer him to approach them. But instead of being allowed to proceed so far as to satisfy his impulse, he must be led away, and the real stallion substituted in his stead. This trial is necessary

cessary for ascertaining the true time of the mare's heat, especially of those which have not yet had a colt; for with regard to such as have recently foaled, the heat usually begins nine days after their delivery; and on that very day they may be led to the stallion to be covered; and nine days after, by the experiment abovementioned, it may be known whether they are still in heat. If they are, they must be covered a second time; and thus successively every ninth day while their heat continues: for when they are impregnated their heat abates, and in a few days ceases entirely.

But that every thing may be done easily and conveniently; and, at the same time, with success and advantage, great attention, expence and precaution are requisite. The stud must be fixed in a good soil, and in a suitable place, proportioned to the number of mares and stallions intended to be used. This spot must be divided into several parts, inclosed with rails or ditches well fenced; in the part where the pasture is the richest, the mares in fold, and those with colts by their sides, are to be kept. Those which are not impregnated, or have not yet been covered, are to be separated, and kept with the fillies in another close, where the pasture is less rich, that they may not grow too fat,

fat, which would obstruct the progress of generation. Lastly, the young stone colts, or geldings, are to be kept in the driest part of the fields, and where the ground is most unequal; that by running over the uneven surface, they may acquire a freedom in the motion of their legs and shoulders. This close, where the stone colts are kept, must be very carefully separated from the others, lest the young horses break their bounds, and enervate themselves with the mares. If the tract be so large, as to allow of dividing each of these closes into two parts, for putting oxen and horses into them alternately, the pasture will last much longer than if continually eaten by horses; the ox improving the fertility, whereas the horse lessens it. In each of these closes should be a pond, standing water being better than running, which often gripes them; and if there are any trees in the ground they should be left standing, their shade being very agreeable to the horses in great heats; but all stems or stumps should be grubbed up, and all holes levelled, to prevent accidents. In these pastures your horses should feed during the summer; but in the winter the mares should be kept in the stable and fed with hay. The
colts

colts also must be housed, and never suffered to feed abroad in winter, except in very fine weather. Stallions that stand in the stable should be fed more with straw than hay; and moderately exercised till covering time, which generally lasts from the beginning of *April* to the end of *June*. But during this season they should have no other exercise, and be plentifully fed; but with the same food as usual. Before the stallion is brought to the mare, he should be dressed, as that will greatly increase his ardour. The mare must also be curried, and have no shoes on her hind feet, some of them being ticklish, and will kick the stallion. A person holds the mare by the halter, and two others lead the stallion by long reins; when he is in a proper situation, another assistant carefully directs the yard, pulling aside the mare's tail, as a single hair might hurt him dangerously. It sometimes happens that the stallion does not complete the work of generation, coming from the mare without making any injection; it should therefore be attentively observed, whether in the last moments of the copulation, the dock of the stallion's tail has a vibrating motion; for such a motion always accompanies the emission of the seminal lymph. If he has performed the act, he must on no

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consideration be suffered to repeat it, but be led away directly to the stable, and there kept two days. For, however able a good stallion may be of covering every day during the three months, it is much better to let him be led to a mare only every other day: his produce will be greater, and he himself less exhausted. During the first seven days, let four different mares be successively brought to him, and the ninth day let the first be again brought, and so successively while they continue in heat; but as soon as the heat of any one is over, a fresh mare is to be put in her place, and covered in her turn every nine days; and as several retain even at the first, second, or third time, it is computed that a stallion, by such management, may, during the three months, cover fifteen or eighteen mares, and beget ten or twelve colts. These animals have a very large quantity of the seminal lymph; so that a considerable portion of it is shed during the emission. In the mares likewise is an emission, or rather distillation of the seminal lymph, during the whole time they are horsing; ejecting a viscid whitish lymph, called the *beats*, which cease on conception. This ichor the *Greeks* called *hippomanes*, and pretended that philtres might be made of it; one remarkable effect

fect of which was, to render a horse frantic with lust. This hippomanes is very different from that found in the secundines of the foal, which Mr. *Daubenton* * first discovered, and has so accurately described its nature, origin and situation. The ejection of this liquor is the most certain sign of the mare's heat; but it is also known by the inflation of the lower part of the *vulva*, by her frequent neighings, and attempts to get to the horses. After being covered, nothing more is requisite than to lead her away to the field. The first foal of a mare is never so strongly formed as the succeeding; so that care should be taken to procure for her, the first time, a larger stallion, that the defect of the growth may be compensated by the largeness of the size. Particular regard should also be had to the difference or congruity of the fashion of the stallion and the mare, in order to correct the faults of the one by the perfections of the other; especially never to make any disproportionate copulations, as of a small horse with a large mare, or a large horse with a small mare; as the produce of such copulation would be small, or badly proportioned. It is by gradations that we must endeavour to

* See Memoirs de la Academie Royale des Sciences, 1751.

arrive at natural beauty; for instance, to give to a mare a little too clumsy a well made horse, and finely shaped; and to a small mare a horse a little higher: to a mare which is faulty in her fore-hand, a horse with an elegant head, and noble chest, &c.

It has been observed that horses fed in dry and light grounds, produce temperate, swift, and vigorous foals, with muscular legs and a hard hoof; while the same breed in marshes, and moist pastures, have produced foals with a large heavy head, a thick carcass, clumsy legs, bad hoofs, and broad feet. These differences proceed from the air and food, which is easily understood; but what is more difficult to be accounted for, and still more essential than what we have hitherto observed, is, to be continually crossing the breed to prevent a degeneracy.

Nature has in every species a general prototype, after which each individual is formed: this, in the realization, degenerates or improves from circumstances: so that, with regard to certain qualities, there is apparently a capricious variation in the succession of individuals; and, at the same time, a remarkable stability in the whole species. The first horse, for instance, was the external model, and
internal

internal mould, by which all horses that have ever existed, or ever will exist, have been formed. But this model, of which we only know the copies, may, by the communication of form, and by its increase, have undergone some disadvantageous changes; or, on the other hand, received improvement. The original form wholly subsists in each individual. But though there are millions of these individuals, not two of them are, in every particular, exactly alike; nor consequently any one of them the same with the model from which it received its form. This difference, which at once demonstrates how far nature is from fixing any thing absolutely, and the infinite variations she spreads through her works, is seen in the human race, in every species of animals and vegetables; and, in a word, in every series of beings. But what deserves attention is, that the model of beauty and goodness seems distributed throughout the whole earth, every climate affording only a portion; and this continually degenerating, unless re-united with another portion from some distant country: so that to have good grain, beautiful flowers, &c. the seeds must be changed, and never sown in the soil that produced them. In the same manner, to have fine horses, &c. foreign stallions

stallions must be given to native mares, or foreign mares to native stallions: for otherwise, grains, flowers, animals, will degenerate, or rather imbibe such a strong tincture from the climate, that the mother will so powerfully influence the form, as to cause an apparent degeneracy: the form remains, but disfigured by many dissimilar lineaments. Whereas let the breed be mixed, and constantly renewed by foreign species, and the form will advance towards perfection, and recruited nature display her choicest productions.

The general reason for these effects does not belong to this place; yet we may be permitted to mention the conjectures, which at first offer themselves. Experience shews that animals, or vegetables, transplanted from a remote climate, often degenerate, and sometimes greatly improve in a small time; I mean within a very few generations. That this is the effect of a difference of climate and aliment, is easy to conceive: and, in length of time, the influence of these two causes must render such animals exempt from, or susceptible of certain affections and distempers. Their temperament must gradually alter; the formation, which partly depends on the aliment, and partly on the quality of the juices, must
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also undergo a change in the succession of a few generations. This change in the first generation is almost imperceptible; as the two animals, the male and female, which we suppose to be the progenitors of the species, had obtained their full shape and constitution before they were brought from their native country: and that however a new climate and food may change their temperament, they cannot act on the solid and organical parts, so as to alter their shape; especially if they had attained their full growth: consequently in the first generation there will be no disadvantageous change; no degeneracy in the first production of these animals; the impression of the model will be exact. At the instant of their birth there will be no radical defect; but the young animal, during its weak and tender state, will feel the influences of the climate. They will make other different impressions on him, than they did on his full grown sire and dam. Those of the aliment will also be much greater, and act on the organical parts during the time of their growth, so as to vitiate a little the original form, and produce germs of imperfections, which will very sensibly appear in a second generation, when the parent, besides its own defects, I mean those it de-

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rives from its growth, has also the defects of the second generation, which will be then more strongly marked: and at the third generation, the defects of the second and third stock, caused by the influence of the climate and aliment, being again combined with those of the present influence in the growth, will become so palpable, as to obliterate the marks of the original stock: so that these animals of foreign extraction, will have nothing foreign in them, but exactly similar to the natives. *Spanish*, or *Barb* horses, whose breed are thus managed in *France*, very often at the second, and always at the third, become so entirely *French* horses, that instead of preserving the breed, there is a necessity of crossing, and renewing it at every generation, by importing *Barb* and *Spanish* horses for the use of native mares. And it is very remarkable, that this manner of renewing the breed, which is only in part, and as it were by halves, has a much better effect than if the renovation was total. A horse and a mare of *Spain*, will not in *France* produce such fine horses, as a *Spanish* stallion with a mare of the country. This, however, will be easily comprehended, if we consider, that when a stallion and mare of different countries are put together, the defects of both

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are compensated. Every climate by its own influences, and those of the food, imparts a certain conformation, which is faulty through some excess or defect. But in a hot climate there will be an excess of fire, in a cold climate there will be a defect, and *vice versa*. So that by joining animals of these opposite climates, the excess of the one supplies the defects of the other. And as that reaches nearest to perfection in nature, which has the fewest faults; and the most perfect forms being only such as have the fewest deformities, the produce of two animals, whose defects are exactly balanced, will be the most perfect production of that kind. And this equality is the more accurately adjusted, the more distant the countries are, or rather the more opposite the climates natural to the two animals are to each other. The compound result is the more perfect, as the excesses or defects of the stallion's constitution are more opposite to the excesses and defects of the mare.

The climate of *France* being moderate, it is necessary, in order to breed fine horses, to have stallions from climates that exceed it either in cold or heat. Among these the horses of *Arabia*, if any can be procured, and *Barbs*, should be preferred: and next to these *Spa-*

nish and *Neapolitan* horses. For cold climates those of *Denmark*; and next to these *Holstein* and *Friezland*. All these horses, given to mares of the country, will in *France* produce very good colts, and be in every respect the better, and more beautiful, as the temperature of the climate was more opposite to that of *France*: so that *Arabian* horses will do better than *Barbs*, and *Barbs* better than those of *Spain*. Also *Danish* horses will produce a finer breed than those of *Friezland*. The want of horses from the climates abovementioned, may be supplied by *English* or *German* stallions; or even the southern parts of *France* may furnish the northern provinces. To give foreign horses to the mares, will always produce a certain advantage: whereas an increase of horses of the same breed in a stud, will always cause a certain loss, as they will, in a very little time, infallibly degenerate.

In the human species, the influences of the climate and aliment are not so powerful as in other animals: and the reason is plain; man preserves himself from the inclemency of the climate: his dwelling and apparel are suited to the seasons; his food also is much more diversified; and consequently does not affect every individual equally, and in the same manner.

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The defects or excesses arising from these two causes, which are always palpable and constant in animals, are much less so in men. Besides, the frequent migrations of people, the mixture of nations, and the travels and removals of particular persons, must be considered; and then it will not be at all surprising that the human race are less affected by the climate; and that strong well shaped and sensible persons are found in all countries. It is, however, credible, that some consequences flowing from experience long since forgotten, taught men formerly the disadvantages resulting from alliances between persons of the same blood; for among all nations, even the least policed, a brother was very rarely permitted to marry his sister. This custom, introduced among us by divine prohibition, but, among other nations, founded on political views only, is perhaps owing to observation. Polity does not extend its prescriptions in so general and absolute a manner, unless connected with nature; but if men once discovered from experience, that a desire of preserving a race, without mixture in one and the same family, would produce a degeneracy, they would consider intermarriages with foreign families as a law of nature: they would all agree in a prohibi-

tion of marriages among their own children. And, indeed, it may be presumed from analogy, that in most climates, men, like animals, would degenerate after a certain number of generations.

Another influence of the climate and aliment is a difference of colours in the coats of animals: the wild in the same climate are of the same colour, with some slight changes; a little lighter or deeper in the different seasons of the year: whereas they that live in different climates are of different colours: but in domestic animals the colours vary prodigiously, as in horses, dogs, &c. Whereas deer, hares, &c. are all of the same colour: the injuries of the climate and aliment being always the same, produce in wild animals this uniformity; and the variety of colour in domestic animals, is owing to the care of man: shelter, variety in food, and mixture of foreign breeds, when the colour of the male is different from that of the female. The latter sometimes gives rise to beautiful peculiarities, as in pyed-horses, where the white and black are so strongly marked, and form such a glaring contrast, that it seems rather the performance of a whimsical painter, than the work of nature.

In coupling of horses, the colour and size
should

should be suited to each other, the shape contrasted, the breed crossed by an opposition of climates. But horses and mares foaled in the same stud should never be joined: these are essential articles; but there are others which should by no means be neglected; as that no short-docked mares be suffered in a stud, because from their being unable to keep off the flies, they are much more tormented by them than others which have a long sweeping tail: and their continual agitations from the stings of these insects, occasions a diminution in the quantity of their milk, and has a great influence on the constitution and size of the colt, which will be vigorous in proportion, as its dam is a good nurse. Care must also be taken that the stud mares be such as have been always brought up in pastures, and never overworked. Mares which have always been brought up in the stable on dry food, and afterwards turned to grass, do not breed at first: some time is required for accustoming them to this new aliment.

Though the usual season for the heat of mares be from the beginning of *April* to the end of *June*, yet it is not uncommon to find some among a large number, that are in heat before that time: but it is adviseable to let this

heat pass over without having them to the stallion, because they would foal in winter; and the colts, besides the inclemency of the season, would have bad milk for their nourishment. On the contrary, if the mares are not in heat till after the end of *June*, they should not be covered that season; because the colts being foaled in summer, have not time for acquiring strength sufficient to repel the injuries of the following winter.

Many, instead of bringing the stallion to the mare, turn him loose into the close, where all the mares are brought together; and there leave him to chuse such as will stand to him. This is a very advantageous method for the mares: they will always take horse more certainly than in the other; but the stallion, in six weeks, will do himself more damage than in several years by moderate exercise, conducted in the manner we have already mentioned.

When the mares are pregnant, and their belly begins to swell, they must be separated from those that are not, lest they hurt them. They usually go eleven months and some days, and foal standing; whereas most other quadrupeds lie down. Those that cannot foal without great difficulty, must be assisted; the
foal

foal must be placed in a proper situation; and sometimes, if dead, drawn out with cords. The head of the colt usually presents itself first, as in all other animals; at its coming out of the *Matrix* it breaks the fecundines, or integuments that inclose it, which is accompanied with a great flux of the lymph contained in them; and at the same time one or more solid lumps are discharged, formed by the sediment of the inspissated liquor of the allantoides. This lump, which the ancients called the hyppomenes of the colt, is so far from being, as they imagined, a mass of flesh adhering to the head of the colt, that it is separated from it by a membrane, called amnios. As soon as the colt is fallen, the mare licks it, but without touching the hyppomenes; which points out another error of the ancients, who affirmed that she instantly devours it.

The general custom is, to have a mare covered nine days after her foaling, that no time may be lost; but it is certain, that the mare having, by this means, both her present and future foal to nourish, her ability is divided, and she cannot supply both so largely, as she might one only. It would therefore be better, in order to have excellent horses, to let the mares be covered only every other year; they would

would last the longer, and bring foals more certainly: for, in common studs, it is so far from being true, that all mares which have been covered, bring colts every year; that it is considered as a fortunate circumstance, if half, or at most two thirds of them foal.

Mares, when pregnant, will admit of copulation, but it is never attended with any superfoetation. They usually breed till they are fourteen or fifteen years of age; and the most vigorous till they are above eighteen. Stallions, when well managed, will engender till the age of twenty, and even beyond; but it must be observed, that such horses as are made stallions, are also the soonest incapable of generation: thus the large horses, which require strength sooner than the slender, and are therefore often used as stallions, as soon as they are four years old, are incapable of generation before they are sixteen.*

The duration of the life of horses is, as in all other species of animals, proportioned to the term of their growth. Man, who is fourteen years in growing, may live six or seven times as long; that is, ninety or a hundred years. The horse, whose growth is at an end

* See le nouveau parfait *Marechal* de M. de Garfaut, p. 68 & seq.

in four years, may live six or seven times as long; that is, twenty-five or thirty years: and the instances that might be produced in opposition to this rule, are so rare, that they cannot be considered as an exception, from whence any consequences might be drawn. And as large horses are full grown sooner than those that are slender; so their lives also are shorter, and they become old at fifteen.

In horses, and most other quadrupeds, the growth of the hinder-parts seems, at first sight, to be more forward than that of the fore-parts: while in man the lower extremities at first are less than the upper. For, in a boy, the thighs and legs are much less in proportion than in an adult. In a colt, on the contrary, the hinder legs are of such a length, that he can touch his head with his hind foot, which a full grown horse cannot do. But this difference is not so much owing to the inequality of the total growth of the fore and hind parts, as to the inequality of the fore and hind feet; which is nature's constant method, and most observable in quadrupeds: for in man the feet are larger than the hands, and likewise sooner formed: and in a horse, where a great part of the hind leg is but a foot, it being composed only of the bones relative to the tarsus,

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or metatarsus, &c. it is not surprizing that this foot should be more extended, and sooner brought into form than the fore leg, the whole lower part of which represents the hand, being composed wholly of the bones of the carpus and metacarpus. At the birth of a colt, this difference is easily observed: the fore legs, on a comparison with the hinder, seem, and indeed really are, much shorter than they will be afterwards; and besides, the thickness which the carcass acquires, though independent of the proportions of the bodily growth, augments the distance between the hind legs and the head; and consequently contributes to hinder the horse from touching it, when he has attained his full growth.

In all animals each species is varied according to the different climates: and the general results of these variations, form and constitute the different breeds, of which we can only observe those which are most conspicuous; that is, those between which there is a sensible difference: overlooking all the intermediate gradations, which here, as every where else, are infinite. We have even increased the number and confusion by countenancing the mixture of these breeds; and, as it were, offered violence to nature, by importing into these climates

mates horses from *Africa* or *Asia*. The primitive breeds of *France* cannot now be known, occasioned by our introducing horses from all countries: and all the distinction of horses now remaining, are some slight marks produced by the immediate influence of the climate. These characters would be much more distinct, and the differences far more sensible, had the breeds of each climate been preserved without mixture: the smaller varieties would than indeed have been less blended, and less numerous; but there would have been a greater number of conspicuous variations strongly marked, and easily distinguished by every person: whereas, at present, to know the horses of different countries, requires long practice, and very great experience. All the information we can have on this head is drawn from travellers, and the writings of the most expert horsemen, such as the duke of *Newcastle*, Messrs. *Garfaut* and *Gueriniere*, &c. and some remarks communicated to us by Monsr. *Pignerolles*, one of his Majesty's equerries, and director of the academy of *Angers*.

The finest horses known in *Europe* are the *Arabian*: they are larger and fuller than the *Barbs*, and not inferior to them in shape. But as few of them are imported into *France*,
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the riding masters have not made any circumstantial observations on their perfections and defects. The *Barbs* are more common, their chest is long and slender, rises beautifully from the withers, have little manes, the head well shaped, small and lean; the ears handsome and well placed; the shoulders flat and slender; the withers narrow and plump; the back straight and short; the flank and sides round, and not bellying out; the haunches firm, and well shaped; the croup or breech generally somewhat long, and the tail pretty high placed; the thigh well shaped, and seldom flat; the legs handsome, well shaped, and without hair at the pastern joint; the foot well made; but the pastern often long. They are of all colours, but generally brown. The *Barbs* are something negligent in their goings; but, properly encouraged, shew an amazing swiftness and vigour: they are very light, and fit for running; and seem of all others the fittest to breed from. It were, however, to be wished that they were of a taller size, the very largest being only fourteen hands; and one of fourteen hands and an inch is very extraordinary. Experience has shewn that in *France, England, &c.* they get colts larger than themselves. Among the *Barbs*, those of
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the kingdom of *Morocco* are accounted the best, except the mountain *Barbs*. Those of the rest of *Mauritania* are inferior to them, as are also those of *Turky*, *Persia*, and *Armenia*. All horses from a hot climate, have a smoother coat than others. The *Turkish* horses are not so well proportioned as the *Barbs*; the neck slim, a long body, and the feet too slender; but are very laborious and long winded. Nor will this appear strange, if it be considered, that in hot countries the bones of animals are harder than in the cold; and for this reason it is, that though their shank bones are smaller than the horses of this country, yet their legs are stronger.

The *Spanish* horses, which are placed next to the *Barb* in rank, have a long thick neck, with a large mane; the head full large, and sometimes the fore-top large; the ears long, but well placed; the eyes full of fire, and the air noble and spirited; the shoulders thick, and the chest broad; the back often something low; the ribs round, but the belly often too large; the croup generally round and large, though in some longish; the legs beautiful and without hair; the sinew well detached; the pastern sometimes longish like the *Barbs*; the foot a little lengthened like that of a mule; and the heel often too high. The fine bred *Spanish* horses

horses are plump, well set, and place the legs well on the ground; they have also a great deal of motion in their paces; great agility, fire, and stateliness. Their coat is generally black, or a light chesnut; though there are some of all the usual colours. But it is very seldom that any are seen with white legs or muzzles; the *Spaniards* having such a dislike of these marks, that they never breed from horses which have them. A star in the forehead is all they require; but they value horses of one intire dark colour as much as we despise them: both these prejudices, though opposite, are perhaps equally ill founded, there being very good horses with all kinds of marks; and some excellent among those which are all of one colour. This minute difference in the coat does not proceed from the nature or constitution of the horse; but from an external, and at the same time so superficial a quality, that a slight wound in the skin is sufficient to produce a white spot: further, the *Spanish* horses, whether intirely of one colour or not, are all marked on the off-thigh with the mark of the stud where they were bred. They are not usually large sized; though some rise to fourteen hands and one or two inches. Those of *Upper Andalusia* are esteemed the best of all, though they are apt to have

have the head too long; but this blemish is overlooked in consideration of their excellent qualities; as courage, gracefulness, obedience, ambition; and in activity they even exceed the *Barbs*. These advantages recommend them above all other horses in the world, whether for war, state, or the manage.

The finest *English* horses greatly resemble the *Arabians* and *Barbs* in shape; indeed they owe their origin to them; but the head is much larger, though well made, and has a fine fore-top; the ears longer, but properly placed. By the ears alone an *English* horse may be distinguished from the *Barb*: but the great difference is in the size; the *English* horses are much larger and well set. Their common height is fourteen hands two inches, and even fifteen hands is not very extraordinary. They are of all colours, and all marks; are generally strong, mettlesome, bold, bearing great fatigue, excellent for hunting and racing, but want air and agility; they are stiff, and have little freedom in their shoulders. The *English* horse-races are much talked of; and indeed there are people in *England* who are extremely expert in that part of the gymnastic art; as, among many other instances, will appear from what a respec-

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table personage * wrote to me from *London* on the 18th of *February*, 1748. Mr. *Thornhill*, post-master at *Stilton*, laid a wager that he would ride three times successively from *Stilton* to *London*, which is two hundred and fifteen *English* miles, in fifteen hours. Accordingly, on the 29th of *April*, 1745, he set out from *Stilton*, and reached *London* in three hours and fifty-one minutes, having rode eight different horses in this first heat: he instantly set out on his return from *London* to *Stilton*, which he performed in three hours fifty-two minutes, riding only six horses. The third heat he made use of the same horses which had already served him, riding only seven of the fourteen; this last heat he performed in three hours forty-nine minutes: so that he not only won the wager, which obliged him to ride this ground in fifteen hours, but he performed it in eleven hours fifty-two minutes: and I question whether any race at the *Olympic* games ever equalled the rapidity of Mr. *Thornhill's* performance.

The *Italian* horses were formerly much finer than at present, the studs having been neglected there for some time past: the kingdom

* The Earl of *Morton*.

of *Naples*, however, still affords fine horses, especially for carriages; but they have, in general, large heads and thick necks: they are also untractable, consequently are difficult to be trained. These defects are, however, in some measure, compensated by the largeness of their size, their spirit, and the beauty of their motions. They are excellent for parade, and very much affect stateliness.

The *Danish* horses are of such a large size, and so well set, that they are preferred to all others for coach horses: some are perfectly well moulded, though in general their formation is not very regular; most of them having a thick neck, broad shoulders, the back a little too long and low; and the croup too contracted for the breadth of the chest: but they all move well, and are in general excellent for war and state. They are of all colours, even the most uncommon; the pye and spotted being seldom seen but in *Danish* horses.

Germany affords some fine horses, but the generality are heavy and thick winded; tho' most of them come from *Turkish* and *Barbary* horses, of which there are many studs; as also of *Spanish* and *Italian* horses: thus they make no figure in hunting and racing; whereas the horses of *Hungary*, *Transylvania*, &c. are very

light and fleet: the *Hussars* and *Hungarians* slit their nostrils, with a view, it is said, to mend their wind, and, at the same time, to prevent their neighing in the field; it being affirmed, that horses whose nostrils have been slit, cannot neigh. It has not indeed been in my power to examine this particular; but it seems natural to think, that the operation can only weaken their neighing. The *Hungarian*, *Croatian* and *Polish* horses are noted for having what is called the mark in all their fore teeth, which continues to old age.

The *Dutch* horses are very good for coaches, and are most commonly used in *France*. The best come from *Friezland*. The countries of *Bergue* and *Juliers* also breed very good ones. The *Flemish* horses are far inferior to those of *Holland*; they have generally large heads, broad feet, and their legs subject to dropfical swellings. The two latter are capital faults in coach horses.

France produces horses of all kinds, but not many which may be called fine. The best saddle horses come from the *Limosin*, being something like the *Barbs*, and excellent hunters; but of a slow growth. They must not be broke young, nor put to any service till eight years old. *Auvergne*, *Poitou*, and the territory

tory of *Morvant* in *Burgundy* also produce very good ponies. But *Normandy*, next to *Limosin*, affords the finest horses; and if not such excellent hunters, they are preferable to the rest for war; are better set, and sooner trained. *Lower Normandy* and *Cotentin* are famous for very fine coach horses; they are lighter, and more sprightly than the *Dutch* horses: *Franche-comté* and the *Boulonnois* furnish very good draught-horses; but a general fault in the *French* horses, is the width of their shoulders; whereas those of the *Barbs* are too much contracted.

Having thus specified such horses as are best known to us, we shall relate the accounts given by travellers, of those foreign horses, with which we are little acquainted. All the islands of the *Archipelago* produce very good horses. Those of the isle of *Crete* * were highly celebrated among the ancients for agility and swiftness; but they are at present very little used in the country itself, on account of the steep mountains and precipices with which it almost every where abounds. The finest horses of these islands, and even those of *Barbary*, are of *Arabian* extraction. The native horses of the kingdom of *Morocco* are much smaller

* See *Dapper's* description of the isles of *Archipelago*, p. 462.

than those of *Arabia*, but very nimble and vigorous.* Dr. *Shaw* † tells us, that the *Egyptian* and *Tingitanian* studs, surpass at present, those of all the neighbouring countries: whereas about a century ago, horses equal to these in goodness, were found throughout all the other parts of *Barbary*. The excellence of the *Barbs*, says he, consists in never making a false step, and in remaining still or quiet when the rider alights or drops the bridle: they have a long pace, and gallop with rapidity; but they can neither trot nor amble, the inhabitants accounting those goings aukward, and even mean. He adds, that the *Egyptian* horses are superior to all others for size and beauty; but these, and indeed most of the *Barbary* horses, owe their origin to the *Arabian* coursers, which are incontestably the most beautiful and stately animals in the world.

According to *Marmol* ‡ (or rather *Leo Africanus* ||, *Marmol* having here copied him almost verbatim) the *Arabian* horses are descended from the wild horses of the deserts of

* See *l'Afric. de Marmol*. Paris, 1667, tom. II. p. 124.

† See *Shaw's travels*.

‡ See *Marmol's Africa*, tom. I. p. 50.

|| See *Leo Afr. de Africae* descript. tom. II. p. 750 and 751.

Arabia, of which there were studs in times immemorial; and thus they are become multiplied to such a degree, that all *Asia* and *Africa* abound with them. Their swiftness is such, that some of them will overtake the ostrich. The inhabitants of *Arabia Deserta*, and of the several parts of *Lybia*, breed a great number of these horses for hunting, but never use them either in journies, or war. When herbage is plenty, they keep them in the pastures; and at other times feed them with dates and camel's milk, which render them vigorous, swift, and thin of flesh. They lay toils for the wild horses, which they eat; the flesh of the young ones, they say, being very palatable: these wild horses are smaller than the others, and commonly of an ash colour; though some are white, with the mane and tail very short and bristly. Other travellers * have given us some curious narratives with regard to the *Arabian* horses, of which we shall only relate the principal articles.

No *Arabian*, however poor and indigent, is without these animals. They usually ride mares; experience having taught them that they endure fatigue, hunger and thirst better than horses. They are also less vicious, more tractable, and

* See le voyage de M. de la Roque fait par ordre de Louis XIV. Paris, 1714, p. 194 & seq. as also l'hist generale des voyages. Paris, 1746, tom. II. p. 626.

not so much given to neighing as horses. They are so well accustomed to their own society, that great numbers of them are frequently left to themselves, sometimes for whole days together, yet they never strike one another, nor do the least mischief. The *Turks*, on the contrary, make little account of mares: and the *Arabians* sell them the horses which they do not intend to keep for stallions. It is a very long time since they began to preserve the breeds of their horses with the most scrupulous attention. Their generations, alliances, and the whole genealogy of them are known. They distinguish their breeds by different names, of which they make three classes: the first is, that of the noble horses, descended from a pure and ancient breed on both sides: the second is, where the horse is of an ancient breed, but not the mare: and the third is, that of common horses. The latter sell for little; but those of the first class, and even of the second, among which are some not at all inferior to those of the first, bear an excessive price. The mares of the first, or noble class, are never covered but by stallions of the same rank. A long experience has taught them the knowledge of all the breeds of their own horses, and also those of their neighbours. They are particularly acquainted with the
name,

name, surname, coat, marks, &c. When they have not stallions of their own which are noble, to cover their mares, they have recourse to their neighbours; and the covering is performed in the presence of witnesses, who sign and seal an attestation of it, before the Emir's secretary, or some other person in office: in this certificate they mention the name of the horse and mare, and enumerate their whole genealogy. Witnesses are also called at the foaling of a mare, who subscribe another certificate, containing a description of the young colt, with the day of its being foaled. The value of the horse depends upon these certificates, which are delivered to the purchaser. No mares of the first class are sold under five hundred crowns; and for some, a thousand are given.

The *Arabians*, instead of a house, have only a tent for their dwelling, which also serves for a stable. The mare, the foal, the husband, wife and children, lie intermixed in a confused manner; the little children often on the body, or the neck of the mare or foal, the creatures remaining still and quiet, as if afraid of hurting them: and so accustomed are these mares to such familiarity, that they will bear all manner of play. The *Arabs*, instead of beating, treat them

them with the utmost gentleness, talk and discourse with them, are tenderly careful of them, let them always go their own pace, except in cases of necessity: but then the mares, when once they feel their flanks tickled with the stirrup, suddenly set off, and fly with an incredible swiftness; leaping over hedges and ditches like hinds; and if the rider happens to fall, they are so well trained, that in the midst of the most rapid gallop they stop at once. All the horses of the *Arabians* are of a middle size, very slender, and rather lean than fat. Every morning and evening they constantly dress them, with so much care, as not to leave the least speck of dirt on their coat. They wash their legs, together with their manes and tails, which they leave at their full length, seldom combing them, lest they should break any of the hairs. They never give them any solid food in the day-time, but let them drink water two or three times. At sun set, a bag, with about half a bushel of barley, well cleansed, is fixed to their head. Thus they eat only in the night; nor is the bag taken from them till the next morning, when it is found empty. In the month of *March*, when there is a sufficiency of herbage, they are turned out to graze. At this season also the mares are covered;

vered; and it is the constant practice of the *Arabians*, to throw cold water on the croup of the mare immediately after the action. When the spring season is over, the horses are taken from the pastures; and, during the remainder of the year, have neither grass nor hay; and even straw but very rarely, their only food being barley. The manes of the foals are cut at the age of a year, or eighteen months, that they may grow the longer and closer. They are backed at two years, or two years and an half at farthest; but before that time they have neither bridle nor saddle put upon them. Every day, from morning till night, all the horses of the *Arabs* stand at the tent door bridled and saddled. The breed of these horses has extended itself to *Barbary*, among the *Moors*; and has even reached the *Negroes*, inhabiting the banks of the rivers *Gambia* and *Senegal*, where the lords of the country have some prodigiously beautiful. Instead of barley or oats, they are fed with maize, pounded or reduced to meal, mixed with milk for fattening them; and in this hot climate they are permitted to drink but seldom.* From another quarter the *Arabian* horses have stocked

* See hist. generale des voyages, tom. III. p. 297.

Egypt, *Turkey*, and probably *Persia*, once so distinguished for its numerous studs, of which *Marco Paulo* * mentions one consisting of ten thousand white mares; and adds, that the province of *Balassia* abounded with large and swift horses, whose hoofs were so hard, that there was no need of shoeing them.

All the horses of the *Levant*, like those of *Persia* and *Arabia*, have a very hard hoof, tho' constantly shod; but the shoes are thin, light, and such as may be nailed on in every part. In *Turkey*, *Persia*, and *Arabia*, the horses are tended and fed in one and the same manner; and their dung is made to serve for litter, after being dried in the sun to take off the smell; when it is pulverized, and the floor of the stable or tent covered with it four or five inches thick. This litter lasts a long time; for when it becomes a second time offensive, it is again exposed to the sun, which entirely takes away the disagreeable smell.

In *Turkey* they have horses from *Arabia*, *Tartary*, and *Hungary*, as well as those which are natives of the country. The last are hand-

* See la description geogr. de l'Inde, par *Marc Paul*, Venetien. *Paris*, 1566, tom. I. p. 41, and Book I. p. 21.

some and very slender;* are remarkably swift, and very graceful; but too tender to bear much fatigue; they eat little, are soon heated, and their skin so sensible, as not to bear a curry-comb, and therefore they are only rubbed with a brush and washed; for this reason they are far inferior to the *Arabian* horses; and, I may say to those of *Persia* also; which, next to the *Arabs*, † are the best and most beautiful of any in the east. The pastures in the plains of *Media*, *Persepolis*, *Ardebil*, and *Derbent*, are very fine; and a prodigious number of horses are kept there, most of which are extremely beautiful, and almost all of them excellent. *Pietro della Valle* ‡ prefers the common horses of *Persia* to those of *Italy*; and even to the most valuable horses of the kingdom of *Naples*. They are generally of a middle size ||, and some very small §, but all equally good and strong. Many, however, are of a fine

* See Mr. *Dumont's* voyage. *Hague*, 1699, tom. III. p. 253 & seq.

† See *Thevenot* voy. *Paris*, 1664, tom. II. p. 220; *de Chardin*. *Amst.* 1711, tom. II. p. 25 & seq. *d'Adam Olearius*, *Paris*, 1656, tom. I. p. 560 & seq.

‡ See les voy. *de Pietro della Valle*, *Rouen*, 1745, in 12mo, tom. V. p. 284 & seq.

|| See voy. *Tavernier*, *Rouen*, 1713, tom. II. p. 19 and 20.

§ See voy. *Thevenot*, tom. II. p. 220.

size,

size, and even larger than the *English* saddle-horses. They have all a slender head, a beautiful neck, and a narrow chest; their ears well shaped and well placed; slender legs, a fine rump, and a hard hoof. They are docile, sprightly, agile, spirited, courageous, and capable of enduring great fatigue. Their gallop is very swift, without ever falling or stumbling; they are robust and easily fed; barley mixed with fine chopped straw being their whole food, which is given them in bags fixed to their heads. Six weeks in spring is all the time they are out at grass.

Their tails are never cut. Geldings are not known among them. Clothes are laid on them to prevent their receiving any injury from the air. They are rode only with a snaffle bridle, and no spur. Great numbers of them are transported into *Turkey*, and still more into the *Indies*. Travellers, who all speak highly of the *Persian* horses, agree in saying, that those of *Arabia* are much superior to them in agility, courage, strength, and even in beauty; adding, that the *Persians* themselves place a much greater value on them, than on the finest horses of their own country. The native horses

* See *Chardin's* travels, vol. II. p. 25, &c.

of *India* are worth little*. Those made use of by the great men of the country, have been brought hither from *Persia* and *Arabia*. In the day time they have a little hay given them, and in the evening boiled pease, mixed with sugar and butter, instead of oats or barley. This food supports them, and gives them some strength; but without it they would in a very little time lose their flesh, the climate being naturally injurious to their constitution.

The native horses of the country, are in general remarkably under size; some are so little, that if *Tavernier* may be credited, the young prince of the *Mogul*, who was between seven and eight years of age, usually rode a horse very well shaped, but not bigger than a large greyhound.†

Experience has sufficiently shewn, that excessive hot climates do not agree with horses. Those of the *Gold* coast, of *Iudia*, of *Guinea*, &c. like the *Indian*, are very bad. They carry their head and neck remarkably low; and totter so greatly in their goings, so that they seem always in danger of falling. Nor will they stir

* See le voy. de la *Boullaye-le-Gonz*, *Paris*, 1657, p. 256, & le *Recueil* des voy. qui ont servi a l'establissement de la comp. des Indes. *Amst.* 1702, tom. IV. p. 424.

† See *Tavernier's* voyag. tom. III. p. 334.

without being continually beaten; and at the same time are so low, that the rider's feet nearly touch the ground.* They are besides very untractable, and, in short, fit only to feed *Negroes*, who like their flesh as well as that of dogs.† Thus the love of horse flesh is common to the *Negroes* and *Arabians*. Something of this kind is also met with in *Tartary*, and even in *China*.‡

The *Chinese* horses are not better than those of the *Indies*, || being weak, spiritless, ill-shaped, and very small. Those of *Corea* are not above nine hands high. The *Chinese* castrate most of their horses, which are so fearful as not to be used in war; and, it may be said, that the *Tartarian* horses conquered *China*. Indeed the horses of *Tartary* are very fit for war; for though they are generally of the middle size, yet they are strong, vigorous, spirited, bold, light and active; they gallop very swift, and hold it a long time: the hoof is hard, but too narrow; the head very

* See hist. generale des voy. tom. IV. p. 228.

† Id. tom. IV. p. 353.

‡ See voy. de M. Gentil. Paris, 1725, tom. II. p. 24.

|| See les anciennes relations des Indes & de la Chine traduites de l'Arabe. Paris, 1718, p. 204, l'hist. generale des voy. tom. VI. p. 492 & 535, l'hist. de la conquete de la Chine, par Palafox. Paris, 1670, p. 426.

airy,

airy, but too small; the neck long and stiff, and the legs too high; yet with all these defects, they may be accounted very good horses; being indefatigable, and exceeding swift. The *Tartars* use their horses nearly in the same manner as the *Arabians*. When they are seven or eight months old, they put boys on their backs, to walk them about, and gallop them at short intervals. Thus they train them up gradually, and inure them to a very sparing diet; but never mount them for an expedition till they are six or seven years old; and then they are made to endure incredible fatigues; * as travelling two or three days without halting, being four or five without any other nourishment than a handful of grass, and, at the same time, twenty-four hours without drinking, &c. But these horses, however robust and hardy they may be in their own country, soon fall away to nothing, if carried to *China* or the *Indies*: whereas in *Persia* and *Turkey* they thrive pretty well. In *Little Tartary* there is also a breed of small horses, on which the inhabitants place so great a value, that they are never sold to strangers. These horses have all the good

* See *Palafox*, p. 427, le recueil des voy. du Nord. Rouen, 1716, tom. III. p. 156. *Tavernier*, tom. I. p. 472, & seq. hist. gen. des voy. tom. VI. p. 603, and tom. VII. p. 214.

and ill qualities of those of *Great Tartary*: a proof how far the same usage, and the same manner of bringing up these animals, impart to them the same dispositions and temper. There are also in *Circassia* and *Mingrelia* numbers of horses which are even more valuable than the *Tartarian* horses. The *Ukraine*, *Wallachia*, *Poland*, and *Sweden* also produce fine horses; but we are as yet without any particular observations made on their good qualities and defects.

If we consult the ancients with regard to the nature and qualities of horses of different countries, we shall find * that the *Grecian* horses, especially those of *Thessaly* and *Epirus*, were in repute, and very excellent in war; that those of *Achaia* were the largest then known; that the handsomest of all were those of *Egypt*, where they were numerous, and where *Solomon* purchased great numbers at a very high price; that *Ethiopian* horses did not thrive on account of the excessive heat of the climate; that the best limbed horses, especially the best saddle and race horses, were those of *Arabia* and *Africa*; that *Italy*, and particularly *Apulia* had also very good ones; that in

* See *Aldrovand. hist. nat. de soliped.*, p. 48--63.

Sicily,

Sicily, Cappadocia, Syria, Armenia, Media and Persia, the horses were excellent, and greatly esteemed for their agility and swiftness; that those of *Sardinia* and *Corfica* were small, but spirited and bold; that those of *Spain* resembled the *Parthian* horses, and were excellent for war; that the *Transylvanian* and *Walachian* horses had small well-shaped heads, manes reaching down to the ground, bushy tails, and were very fleet; that the *Danish* horses were well made, and good leapers; that those of *Scandinavia* were small, well moulded, and very nimble; that the *Flemish* horses were strong; that the *Romans* had very good saddle horses, and others for carrying burthens, from the *Gauls*; that the *German* horses were ill-shaped, and so bad as to be of no use; that the *Swiss* had great numbers, and those very good for military service; that the *Hungarian* horses were also very good; and, lastly, that the *Indian* horses were both very small and very weak.

From all these facts the result is, that the *Arabian* horses, both for goodness and beauty, have been at all times, and still are, the most valuable in the world; that it is from them immediately, or mediately by the means of *Barbs*, the finest horses in *Europe, Africa* and

Asia are procured; that the climate of *Arabia* is possibly the true and most proper climate in the world for horses; that, instead of crossing the breed by foreign mixtures, great care is taken by the *Arabians* to preserve them entirely pure; that if their climate is not naturally the best climate for horses, the *Arabs* have made it such by their particular attention in all times to ennoble the breed, by putting only such individuals together, as were of the first rank, and the best shaped; that this care being continued through ages, may have brought the species to a perfection beyond what nature alone could have performed in the best climate. It may also be concluded from the above observations, that climates, where the warmth is greater than the cold, and the soil of the country dry, are the places which agree best with the nature and constitution of these animals; that, in general, small horses are better than large; that care is no less necessary to them all than food; that familiarity and caresses are much more prevalent with them, than violence and punishments; that in horses of hot countries, the bones, hoofs and muscles, are harder than in those of other climates; that however heat may better agree with these animals than cold, yet not excessive heat; and that
intense

intense cold likewise hurts them: that, in fine, their constitution and temper almost entirely depend on the climate, food, care taken of them, and the manner of breeding them up.

In *Persia*, *Arabia*, and several other parts of the *East*, horses are not castrated, as is generally done in *Europe* and *China*. This operation certainly diminishes considerably their strength, spirit, courage, &c. But they derive from it mildness, docility and tractableness.

In this operation, their legs being tied with ropes, they are thrown on their back, the scrotum or purse, is opened with an incision knife, the testicles are drawn out, and the vessels and ligaments belonging to them divided. Then the wound is closed up, and the horse is carefully watered twice a day for a fortnight, or often washed with cold water; and during the whole time he is fed with bran soaked in a large quantity of water, in order to keep him cool. The proper times are spring and autumn; great heat and great cold being equally unfavourable. With regard to the age when the operation should be performed, mankind differ; in some countries horses are castrated when they are not above a year, or eighteen months old, or as soon as the testicles are clearly

discernible on the outside; but the most general and judicious practice is, not to castrate them till they are two, or even three years old; because the later they are castrated, the more they retain of the masculine qualities. *Pliny* * says, that a horse castrated before he has shed his foal teeth, never loses them: but this fact I have endeavoured in vain to verify; for both young horses and young geldings equally cast their foal teeth: and it is probable, all the grounds the ancients had for advancing such a fact was, the analogy which they thought subsisted between the teeth of a horse and the horns of a deer, roe-buck, &c. which indeed never drop off after the creature has been cut. If a gelding is incapable of generation, many instances shew that he can still copulate.

Horses of all colours, like most other hairy animals, shed their coats once a year; generally in the spring, but sometimes in the autumn. They are then weaker than at other times, and should therefore be more tenderly used, have some small addition made to their food, and be more regularly looked after. Some horses are also known to shed their hoofs; a

* See *Plin. nat. hist.* in 8vo, *Paris*, 1685, tom. II. lib. II. p. 74. p. 558.

misfortune often attending such as have been brought up in wet marshy countries, like that of *Holland*.

Geldings and mares are less addicted to neighing than stone-horses; and their tone less full and deep. We may distinguish five * different kinds of neighing, expressive of different passions: the neighing of joy, which is continued for some length, rising and terminating in sharper sounds; at the same time the horse kicks gently, without intending to strike. The neighing of desire, whether of lust or fondness, in which the horse does not kick; and the tone, after some continuance, terminates in a deeper sound. The neighing of rage, during which the horse kicks and strikes with all his force, is very short, and also sharp toned. That of fear, during which he also kicks, is little longer than that of rage; the tone deep, hoarse, and seems to come wholly through the nostrils; this neighing has some affinity with the roaring of a lion. That of grief is a less neighing than an ejaculation, or plaintive snorting, of a deep tone, and following the alternatives of respiration. It has been farther observed, that those horses which neigh the

* See *Cardan. de rerum varietate*, lib. VII. cap. 32.

oftenest, and especially from joy or desire, are the best and most generous. Stone-horses have also a stronger tone than either geldings or mares: from the very birth the voice is stronger in a male than in a female. At two years, or two years and an half, that is, at the age of puberty, the voice of both horses and mares becomes stronger and deeper, as in man, and most other animals. The horse, when eager with love, desire, or appetite, shews his teeth, and seems to laugh; he also shews them when angry, and intending to bite. Sometimes he puts out his tongue to lick, but not so often as the ox, who is giving to licking much more than the horse; and yet is less susceptible of careffes. A horse also remembers ill usage much longer, and is more easily put out of humour than an ox; his fiery and courageous temper animates him immediately to exert his utmost strength; and when he finds that more is required of him he grows angry, and cannot be induced to comply. Whereas the ox, naturally dull and sluggish, is not so soon vexed, nor so soon discouraged.

The horse sleeps much less than man. When in health he seldom lies down above two or three hours at a time, rising up afterwards to feed; and when over-worked, he lies down a second

second time after feeding. But in the whole twenty-four hours he seldom sleeps above three or four: some horses never lie down, but always sleep standing. And those which lie down, sometimes also sleep on their legs. Geldings have been observed to sleep oftener and longer than stone-horses.

Quadrupeds do not all drink in the same manner; though all are under the like necessity of stooping their heads to the water, as they cannot otherwise reach it: the monkey, the maki, and some others excepted, who having hands, can drink like a man out of a vessel given them; for they put it to their mouth, and inclining the vessel, pour out the liquor, which they swallow merely by the motion of deglutition. In this manner man usually drinks, as being the most convenient; but he can besides drink several other ways, as by inhaling the liquor with his lips placed near one another, and properly contracted; or by dipping his nose and mouth so far into the water, that his tongue is surrounded with liquor, when he has no other motion to make than that necessary in deglutition; by biting as it were the liquor with his lips; or, lastly, though with rather more difficulty, by stretching out his tongue, spreading it, and forming it like a little

little cup, which conveys a small quantity of water into his mouth. Most quadrupeds might also drink several ways; but, like us, they chuse the easiest, and constantly keep to it. The dog, the aperture of whose mouth is very large, and furnished with a long and slender tongue, drinks by lapping; that is, licking the water, and forming with his tongue a cup, which being filled every time, brings up a pretty large quantity of liquor: this method he prefers to that of wetting his nose. Whereas the horse having a less mouth, and its tongue too thick and short to form a large cup, and which, besides, drinks more eagerly than he eats, thrusts his mouth and nose to some depth into the water, which he thus plentifully swallows by the simple motion of deglutition. But this very circumstance obliges him to drink all at a breath; whereas the dog, while drinking, breathes freely: and therefore horses must be suffered to take several draughts, especially after hard riding; the motion of respiration being short and quick. They should not drink very cold water; for, besides the colic, frequently produced by cold water, the necessity of dipping their muzzles into the water, affects their nostrils; and thus they probably contract the germ of that distemper
called

called the glanders, of all others the most formidable to this species of animals; for it has lately been discovered, that the seat of the glanders is in the pituitary membrane;* and consequently that it is a real rheum, which in length of time causes an inflammation in that membrane; but, on the other hand, those travellers who mention the diseases of horses in hot countries, as *Arabia*, *Persia* and *Barbary*, do not say a word of the glanders being so common there as in cold climates; so that I believe the coldness of the water may be considered as one of the causes of this distemper, these animals being obliged to dip their nose and nostrils into the water, and keep them there some considerable time. This evil might be prevented, by never giving them cold water, and always wiping their nostrils after they have done drinking. Asses, which are much more afraid of cold than horses, and so nearly resemble them in their internal structure, are far less subject to the glanders; a circumstance perhaps entirely owing to their drinking differently from horses; for the ass

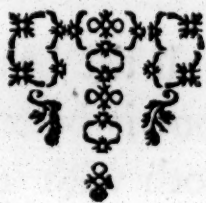
* Mr. *de la Force*, king's farrier, was the first who demonstrated the seat of the glanders to be in the pituitary membrane; and he has attempted to cure horses by trepaning them.

instead

instead of thrusting down his mouth and nostrils into the water, just touches it with his lips.

The other diseases of horses I shall pass over. It would be carrying natural history too far, if to the history of an animal we were to add that of his distempers. I cannot, however, conclude the history of the horse, without expressing some concern, that the health of this useful and valuable animal has hitherto been left to the care and blind practice of men destitute both of skill and literature. That branch of physic, by the ancients termed *Medicina Veterinaria*, is now scarcely known but by name; and I am persuaded that the physician who should turn his thoughts towards it, and make that study his principal view, would soon find his labours rewarded with ample success: he would not only acquire riches, but, instead of degrading himself, obtain a distinguished reputation. Nor would this branch be so conjectural and difficult as the other: for the food, the manners, the influence of sensations; in a word, every cause being more simple in this animal than in man, the diseases must be less complicated, and consequently more easy to be known, and treated with success. He would also have a full liberty of
making

making experiments, trying new remedies, in order to extend, without fear of invective, this branch of knowledge; whence, by analogy, consequences might be drawn to the improvement of the art of healing man.

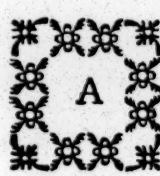




DESCRIPTION

OF THE

H O R S E.


AMONG all the beasts that range the earth, none is better known than the horse, both with regard to the external and internal parts of his body; Man also takes remarkable care in the breeding and training this creature; all his paces are directed by an art founded on rational principles. At the riding schools only can be seen all the particulars that horses are taught by the force of custom; all they are brought to perform by the assistance of the bit and spur, &c. This art, which princes and monarchs do not think beneath them, places the horse in a glorious station. Here dignity is given to his carriage, and gracefulness to his attitudes; his strength and all his agility are put to the trial; his utmost swiftness is exerted, his ardour increased,

his

his courage animated : in fine, his constancy is tried, his docility cultivated, and all the resources of his instinct displayed. That science, the end of which is to strengthen or restore health, to prevent death, and prolong life; I mean physic; in the investigation of its principles, and the administration of its remedies, does not exclude the horse. Accordingly, there has hence been formed the most valuable art of farriery, for preventing the diseases of horses, discovering, ascertaining and curing them, and determining the operations to be performed on the different parts of the horse which happen to be affected. This art extends to all the wants of horses, and the practitioners devote themselves wholly to their service. In studs these animals are treated with a particular and continual care, for preserving and propagating their species. Nay, even before they are foaled these cares have a happy effect, from the judicious choice of the stallions and mares that are to engender them. By properly combining the qualities of the former and the latter, the result is now foreseen ; and thus the strength and beauty of horses, and the spirit of their instinct, are perpetuated.

Amidst the enquiries and observations made concerning horses, there has been formed, as it were,

were, a particular language, the terms of which are appropriated to the arts which relate to these animals ; so that a horse cannot be described in a satisfactory manner, without previously explaining the sense of the terms, defining the several parts of his body, and giving their perfections or defects.

In explaining the terms of art relative to the horse, we shall begin with those of the head, following the most natural order, namely, define the parts of the body before those of the extremities ; though most authors who have written on this subject, have mentioned the fore extremities before the body.

The two parts of a horse's head A (see the plate) answering to the temples in man, are called by the same name.

The cavities B between the eyes and ears, above the eye-brows, are called the eye-pits.

In some cases, two parts only are distinguished in the eye, the external and the internal ; the former is the outward coat or tunicle, and the latter those parts which are seen by looking into the eye through the crystalline humor, by the aperture of the pupil ; they also use the word pupil to signify the internal parts of the eye : but how can this imply the inside of the eye, the pupil being only an aperture

aperture of the uvea, communicating with the inward parts of the eye.

The parotid glands C, which are situated between the ear and the locking of the under jaw, are called the vives.

The part D, contained between the eyes and nostrils, is called the face, and answers to the part called the nose in a man.

The cartilage forming the circular aperture of the nostrils, and terminating them above and below, is termed the rim of the nostrils.

Tip of the horse's nose F is the septem that divides his nostrils, and is formed by the lower parts of the face, terminating at the upper lip. *Solleyfel*, however, calls that part of the upper lip, under the nostrils, the nose.

The two bones of the lower jaw extend on both sides the head, from the eye to the joint G, near the throat; and from the joint G to the chin H.

The beard I is the place where the two bones of the lower jaw meet above the chin.

The cavity formed by the two bones of the lower jaw, and extending from the throat of the beard, is called the channel, as is also that in which the tongue lies.

Different names have also been given to the six incision teeth in each jaw.

H

The

The two fore teeth are called gatherers; those adjoining to the gatherers, are termed the middle teeth, and the last on each side are the corner teeth.

The two canine teeth in each jaw, one on each side, and at some distance from the incisori, are called tushes.

The void spaces in the two jaws, between the incisori and maxillari teeth, are called bars.

The capacity formed by the ribs is called the chest; but the lower part of the body V, is called the belly.

The flanks X, are at the extremity of the belly, at the end of the ribs, and under the kidneys; they reach to the beginning of the haunches.

The haunch Y is formed by the bone, which in a horse terminates the upper part of the flank, and extends to the rump, or croup.

The rump Z is round, and extends from the kidneys to the tail.

The tail is distinguished into two parts, the hair and the dock, that is the fleshy part of the tail without its hair.

The buttocks *a* are situated under the rump, and the origin of the tail, and extend to the place where the hind leg joins the body.

In order to explain the names given to the different parts of the fore-legs, we must return to the shoulder, which among horsemen includes the shoulder-blade *b*, and the humerus *c*, consequently the parts answering to the shoulder and arm of a man; thus the real arm of a horse seems blended or confounded with the shoulders being united with the body under the same skin. Thus the elbow *d* is placed backward as in man; but in a horse it is situated opposited to the ribs, at the top of the fore-leg, where it begins to separate from the body; this is the first joint which appears prominent; for that of the arm with the shoulder is hidden, by the skin of the animal.

The first part of a horse's fore-leg, separated from the body, is called the arm, though it answers to what is called the fore-arm in man. The external part *e*, of a horse's arm is called the thick part of the arm, and over its internal surface runs a vein, called the plat vein.

The joint *f* is called the knee, situated at the extremity of the arm, and at the place of the wrist in man: and, when the leg is bent, it forms an angle forwards.

The shank *g* is the second part of the fore-leg. It begins at the articulation of the knee, and answers to the metacarpus in man. Be-

hind the shank is a tendon *b*, reaching from one end to the other, and commonly called the back sinew.

The fetlock-joint *i*, is the articulation at the lower extremity of the shank.

The pastern is a tuft of hair *k*, covering a kind of soft gristle behind the pastern joint.

The pastern *l*, is the part of the leg reaching from the fetlock-joint to the foot.

The coronet *m*, is an elevation at the lower extremity of the pastern, decorated with long hair falling round the foot.

The hoof is as it were the nail, the fore part of it *n* is called the toe, and the sides *o* the quarters. The hind part of the hoof is a little raised, and divided into two pieces, both included under the name heel; they extend to the middle of the under part of the foot, and re-uniting under the sole, which is as it were the bottom of the foot, form the frog. It is a horny substance like the rest of the foot, of which it is indeed a part; but the horn of the sole is harder than that of the frog, and softer than that of the hoof.

To explain the names of the several parts that compose the hind-leg, we must return to the buttocks; each of these include the former, and thus containing what is called the thigh

thigh in a man: the buttock therefore is properly the horse's thigh articulated to the body. It is terminated on the fore part by the stifle *p*, which is properly the articulation of the knee, and contains the knee-pan. Thus the stifle is placed at the lower extremity of the haunch, at the beginning of the flank, and changes its place as the horse moves.

The upper part *q* of a horse's hind leg, when detached from the body, is called the thigh; it extends from the stifle and extremity of the buttocks to the ham *r*, and answers to the leg in man. Accordingly the horse's thigh has a fleshy part *s*, resembling the calf of a human leg. On the inward surface of the thigh runs a vein called the crural vein.

The ham or hock, is the joint *t* at the extremity of the thigh, and bends forwards. This articulation corresponds with the tarsus in man. The hinder part of the joint called the point of the hock, is properly the heel. What is commonly called the great finew, which terminates at the point of the hock, is a tendon answering to the tendo *Achillis*, inserted into the human heel.

This is the proper place to mention a part which is found in each leg of a horse. In the

fore legs its position is within the arm, a little above, and on one side of the knee; but in the hind-legs, a little below, and on one side of the ham, also on the internal part: I mean, a little bare knob about the size of a chesnut, of the consistence of soft horn, and which from its figure is called the chesnut. It grows in some horses to the length of an inch, or an inch and a half, and then it falls off, but soon after shoots out again.

Under that part of the hind-leg called the hock, is the shank *u*, the pastern joint *x*, the pastern *y*, and the foot *z*, as in the fore-legs.

After this explanation of the particular names, the general ones become more easy and simple. A horse is divided into three principal parts; namely, the fore-hand, the body, or carcase, and the hind-hand. The fore-hand includes the head, neck, withers, breast and fore-legs. The body is composed of the back, kidneys, ribs, belly and flanks. The hind-hand comprehends the rump, haunches, tail, buttocks, stifle, thighs, hocks, and the other parts of the hind-legs.

Another general division of the horse is into four parts, the head, the body, and the fore and hind trains; the back, the kidneys, the belly, the ribs, and the flanks compose the body;

body; the fore train is formed of the neck, the shoulders, the breast and fore-legs; and the hind train, of the rump, the tail, the haunches and the hind legs.

Technical terms are equally employed in describing the different colours of a horse's coat, as in expressing the different parts of his body; the great variety in the colours, blendings and gradations having multiplied the names, and most of them being known only to those who have made horses their study; it is proper that their language may be rendered intelligible, to explain these names, and at the same time specify the different colours observable in these animals.

Though the diversities in the colours of horses are very great, yet they are not so various as to require, that in our detail we should follow a methodical order to assist the memory; we shall therefore only range them into simple colours, extending themselves all over the horse's body, without any mixture of others; into compound colours, that is, those mixed with others; and into strange and extraordinary colours. According to this method, the simple colours are the white, the dun, the sorrel, the bay, and the black. The compound colours are, the grey, the mouse, the

roan, and red roan. Lastly, the extraordinary colours are the tyger, the pye-bald, the strawberry, and the flea-bitten. But instead of following these divisions, it will be better, in imitation of several authors, to begin with those colours which are most common, and seem most natural to the horse; the others appearing to belong to him only as a domestic animal. Indeed when it is remembered that the yellow, the bay, the brown, or the fallow, are the most common, and therefore the most natural colours of wild animals; and that the bay, composed of tints of the above colours, is that most common to horses; we are inclined to believe that were they wild, they would be all bay, at least in our climate. The explanation therefore of this colour ought to precede all others.

The bay resembles in colour a reddish chesnut, with several gradations, distinguished by the following terms; the bright bay, the light and dark chesnut, the brown bay, the yellow bay, the blood bay, and the bright dappled bay. The brown bay is a very dark brown, almost black, except the flanks and the tip of the nose, where the hair has a reddish cast. The yellow bay requires no description. The dappled bays are those whose rumps are marked with

with a deeper bay than any other part. The same term is also applied to chesnuts, which are decorated with clearer spots of a brighter bay, or rather to those whose rump is marked with a darker bay. The manes and tails of all bay horses are black.

There are three different species of blacks, the rusty, the common, and the jet. The first has a brown or rusty cast, and is perhaps more properly a species of brown bay. Black horses are little less common than bay. Horses of a rusty black, have their flanks and extremities of a faint, or paler colour than that of the rest of the body. The jet, or bright black is clear, sleek, and very black. There is likewise a very shining black, which is, in some particulars, distinguishable from the jet.

The dun colour is of a yellowish cast, and some of these horses have white manes and tails; but others have them composed of dun and black. The latter have a black list extending all along the spine of the back to the tail. This is generally called the mule's list. The dun has also several gradations; that in which there is the least tincture of yellow, is called cream, being a dull white, or blended with a very slight mixture of yellow. The bright dun has a little more yellow in the mixture,

ture; the common dun still more; the golden dun is of a brighter yellow; and, in fine, the dark dun is of a duller or more charged colour.

The wolf colour is of two kinds, clear and dark; both have tinges of dun, and sometimes the mule list.

The sorrel is a kind of russet bay, or cinnamon colour; this also has several gradations; namely, the bright sorrel resembling the common colour of a cow; the common sorrel, which is a medium between brown and light; the bay sorrel inclining to the red or russet; the dark, and the adult sorrel, which is very deep and brown. In some sorrel horses the mane and tail are white, and in others black.

The roan is a mixture of red and white. It has also been defined as a compound of white, a dull grey, and a bay. It is distinguished into three kinds, the common roan, the red roan, and the dark roan. In horses of this colour the head and extremities are white, the body roan, or, according to some authors, of a dull grey.

Grey horses have a coat composed of white and black, or bay, and are divided into several sorts; as dappled grey, silver grey, dusty grey,

grey, &c. Dappled greys have on the rump, and other parts of the body, several round spots, some blacker, and others whiter, pretty equally scattered. The silver greys have very few black hairs, and those thinly scattered on a white sleek ground, in some measure shining like silver. In the coat of horses called dusty greys, there is a considerable mixture of brown and black with the white. White manes and tails on horses of this colour have been greatly admired. The iron grey have a great deal of black, and little white; the nutmeg grey is a mixture of bay, black, and white; the vinous grey is every where mixed with bay; the fronted grey is a white coat decorated with dark reddish spots, pretty equally scattered over the head and body; the thrush grey is a foul colour, resembling that of thrushes, whence it has its name; horses of this colour have a reddish coat, and a great deal of black mixed with the white: the sterling grey also owes its name, to its resembling, in some measure, the colours of that bird; it has a browner tinct than the dull grey, and the same name is retained, though it has a much larger mixture of black. The horses called coal grey, are of a white or grey coat, decorated with black spots, as large as the palm of the hand, and scattered irregularly;

larly; when these spots are larger than common, the horses are distinguished by the name of tygers. Mouse grey horses have generally their extremities black, and the mule list. All grey horses become white with age, their bay or black hairs whitening as they decline, but white colts are rarely seen; and it may be known whether a horse was grey in his youth, by some remains of that colour still visible about his knees and hams.

The colour called porcelain, is a grey mixed with spots of a bluish slate colour, not unlike blue and white china.

The peach blossom is a mixture of bay, white, and sorrel, in such proportion as to resemble, in some measure, the colour of peach blossoms.

Pyed horses have a coat of white and other colours, irregularly variegated with large spots. They are of various kinds, as pies, which are white and black; bay pies, composed of white and bay; sorrel pies, which are white and sorrel.

But whatever the colour of a horse be, those whose tails and manes are black are most esteemed; and, on the contrary, such horses whose flanks and extremities are of a colour

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less deep than that of the body, and, as it were, washed, are least esteemed.

A white mark in the forehead of a horse is called a star: this mark is more or less large; but if it extends from the forehead to the nose, it is called a blaze. This white mark is not pleasing when it entrenches on the brows; nor when it extends to the tip of the nose. The star, the blaze, and the white on the tip of the nose, may sometimes be seen in one individual. There are several methods of making stars by art, that is, of changing the colour of the hair into white, which may be done either by taking off the skin, or burning it; for the hair that grows again, after the healing of the wound, will be white. There are also several methods for dying white eye-brows, or grey or white hairs into bay or black; but this lasts no longer than snoding time, the new hair being always of its natural colour.

If a horse has the lower part of the leg white, he is called balzane, or white footed. When fringed at the top, or irregularly terminating in serrated points, it is called dented balzane. If marked with black, it is an ermined, or patched balzane, or an ermined leg. If it extends to near the knee or hock, he is said to be too high shod; if he has such a mark

mark on the hind and fore-leg of the same side, he is said to be but indifferently marked; but if the balzanes are on the off fore-leg, and near hind-leg; or on the contrary, on the near fore-leg, and the off hind-leg, he is said to be traversed or crossed marked. Lastly, if the extremities of all the four legs be white, we say that he has four white stockings.

It is impossible to distinguish all the tincts, mixtures, and gradations of horses. Nor can the size or figure of all the spots and marks observed on some of those stately animals be described. Not that a great variety of colours essentially different, are found in horses; for the greatest part of them might certainly be imitated with white, black, and orange; but there is such a multifarious variety in the mixture, that there is no possibility of finding a distinguishing appellation for every sensible difference in the tincts. So that horses will be often seen, whose coats are something different from any of the above descriptions. But from a proximity of resemblance they may be expressed, by modifying the received denominations, or employing others.

The position, figure, and extent of the spots, like the colours, vary more or less in each individual of domestic animals. These external
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differences have, by some, been thought sufficient for forming a judgment of the internal parts of horses, and the tincts and dispositions of the colours have been considered as real signs to indicate the good or bad qualities of these creatures. And this not only with regard to the constitution and temper, but also the instinct and qualities of a horse. But to render such indexes certain, before we draw any inferences, proper experiments should have been made on wild beasts. Their colours are much more constant and uniform, seldom varying but with the climate and seasons. Every species also has its distinct colours, and likewise qualities relative to the temper and instinct, which are much more evident than can possibly be in individuals of the same species: and thus by contrasting one species with another, for the colour of the coat, and the good and bad qualities of the individuals in general, we have the advantage of comparing extremes; whereas if our observations are limited only to individuals of one species, all we can discover is, the same individual quality more or less marked; but always similar with regard to the specific characters.

Had this subject been duly investigated, a false prepossession would not have subsisted so long;

long; all connoisseurs in horses would have agreed with the most accurate observers, who smile at the pretended indications drawn from the colour of the coat: this is an error which experience has at last overthrown, and it is now become an axiom, that there are good horses of all colours. All that can be said in favour of this antiquated prejudice is, that grey horses, especially those of an iron grey, are suspected to be short sighted, and that strength and vigour is wanting in those whose coat is of a clear colour; especially if the colour be lighter on the flanks, and the tip of the nose than that of the rest of the body: whereas, if there be any bright bay in those places, they are concluded to be full of vigour; but experience has shewn that even these marks are deceptive; so that all the attention due to colours, is only as they relate to the beauty, and consequently the price of horses. Some colours are highly valued for their singularity; for judgment has never yet been able to get real beauty preferred to singularity.

For my own part, I believe that certain colours, especially the marks or spots seen on the face of several horses, mislead and deceive us by a false appearance; for they change the aspect of the animal, and, as it were, disguise him;

him; for instance, horses with a white blaze have been thought capricious; but why? because this interruption gives them a singular appearance, as scars on the face of a man give him a harsher look. And if a star in the forehead of horses is accounted a good sign, it is only when it is placed in the middle, in which situation it is a beauty rather than a defect. I am also inclined to think, that the white stockings being so much taken notice of is owing to the parts on which they are situated, which being often in motion, attract the sight more than other spots; and that if they have been generally taken for bad indications, it is only because their white feet, being more conspicuous, appear to pass closer together than those of other horses; and it was consequently supposed that the creature might be more subject to stumble; whereas those which have stockings on all the four legs, are not included in this suspicion, there not being the same apparent inequality in their going. But it would be useless to dwell any longer on this subject, and combat prejudices, which the most expert horsemen have now abandoned; their examples will have more power than reason, to undeceive others; truth being once known, time

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alone will gradually extinguish error. I shall now return to the observations made on the coats of horses, and principally with regard to certain colours on different parts.

All the horses of the eastern and southern countries, that is, of the hottest climates; I mean the *Turkish, Persian, Arabian* and *Barbary* horses, have a much smoother coat than others. That this proceeds from the temperature of the climate is evident; but to explain the cause is a difficult task.

The *feather* is an arrangement of hairs disposed nearly like the petala of a single flower, and has been compared to a small pink. It is a point, whence the hair parting, as from a center, revert so as to form a conic cavity, or small funnel. The most common places of those feathers are in the forehead, the breast, and the belly; some horses have them in other parts. Sometimes two or three of them are seen together on the forehead, or on the hinder bend of the thigh.

The *Roman sword* is a kind of furrow, formed by the hair being inverted; it is nothing more than a long feather, and has its name from its figure, being like that of the sword used by the ancient *Romans*; it runs
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along the top of the neck near the mane, and is very rare; whence those horses, which are adorned with this beautiful mark, are bought up at any rate, by those who are very curious in a horse's coat. Sometimes a horse is found with a *Roman sword* on each side of his mane, which greatly increases his value.

The bare enumeration of the foregoing terms, shews the horse to be one of these animals, which prove remarkably useful to man; since most of the parts of his body, as well as the variety of his colours, are expressed by names peculiarly adapted to him. So great a regard for the horse could only flow from motives of interest; but the perfection we require in every part of this animal to render him beautiful, is at once a proof of the pleasure we take in him, and of his manifold utility. The ox is full as useful to us as the horse; it serves us for food; yet a fine ox implies no more than a large fat ox. On the contrary, we have seen, that the beauty of the horse depends on a great variety of conditions. Rules have been established for judging of the beauty of horses; and in order to determine the proportions of the several parts of their bodies, the different uses in which we employ these animals, have been considered

dered equally with the elegance of their shape; thus every proportion by which their bodies are weakened or dulled; every proportion which renders them less serviceable or sickly, is considered as a defect equal to a deformity. I shall therefore, from the observations of the best riding masters,* point out a method for discovering these defects, and judging of the blemishes which disfigure most horses; for in every species both goodness and beauty are rarely found.

When the head of a horse is large and square, it is said to be ill shaped, and commonly heavy on the hand. If there be too much fat on it that the horse may be classed with those called fat heads, the horse is subject to distempers in his eyes; yet if entirely bare of flesh, the eyes would not be a whit better, all extremes being equally dangerous, but were it only large, without being fat, the deformity would not affect the eyes, yet the horse would be equally disfigured; for it is impossible for a horse with a large head to have an air of dignity or beauty. Another de-

* See the true and complete horseman, &c. by the Sieur de Solleysel, 4to. Paris, 1672. The new perfect horseman, &c. by M. de Garsault, 4to, 1746. The school of horsemanship, &c. by M. de la Guereniere, fol. 1751.

fect is, for the head of a horse to be too long. When the tip of the nose is not in a perpendicular direction with the forehead, the horse carries his head ill. And when the upper part of the head rises above the curvature of the neck, the head is said to be ill placed.

Horses having thick lapping ears are unsightly. When there is too great a distance between the ears, especially at the lower part, they are ill placed; and when not nearer at the tip than the root, the hearing is defective. Another fault is, for a horse to be continually lowering his ears like a pig. If the front or forehead be low and hollow, it is a great blemish.

A horse with a large eye, projecting as it were out of his head, appears dull and stupid; and small hollow eyes are called pigs-eyes; which, besides giving a horse a melancholy look, impairs his sight.

Great accuracy is required in examining a horse's eyes, so as to be assured that his sight is good. The person should stand near the light, but take care to be shaded; moving the hand before the eye, to observe whether the horse will shut it, is but a doubtful trial; as the impression of the air agitated by the motion, may make the horse shut his eye, with-

out perceiving any object. There is also a custom of looking at the eye, to see whether the cornea reflects objects like a mirror; but this trial is also faulty, as this effect will be produced if the cornea be bright, which may be the case of a very bad eye, even without being transparent. We ought therefore to be assured of this transparency, or to know whether the vitreous humor be turbid, or of a bad colour, instead of being clear and transparent; for in order to give a distinct view of the pupil, it must be diaphanous. When the vitreous humor is turbid or suffused, it is an indication of the horse's being subject to fluxions. If this distemper has vitiated the eye to a certain degree, it is smaller than the other, which shews that it wastes, and consequently is totally spoiled. An eye may be good, though apparently smaller than the other, from the pupil's having been contracted by some accident; but it is then neither turbid nor brown. There are also temporary diseases, which for a time affect the sight; as the strangles, the coming of the foal teeth, and of the tusks of the upper jaw. If you can discern at the hollow of the eye a small white spot, called by horsemen the dragon, the sight of the eye is lost beyond recovery; that speck
increasing

increasing in time so far as to affect the pupil. When the pupil appears of a greenish white, it is a defect, though not always attended with the loss of sight. If the pupil has more white than green in it, the horse is said to have a wall-eye.

When the two bones of the under jaw are too much loaded with flesh, it is said to be square, and considered as a deformity; but if these bones are too near each other, and the channel between them not sufficiently broad or hollow, it is a defect; for the horse not being able to bring the bony septa of this channel on each side of his throat, which is called bridling, prevents him from carrying a fine head, unless the neck be thin in proportion to the contraction of the channel; if any tumor be perceived in this channel, it denotes a distemper.

The over largeness or smallness of a horse's mouth is inconvenient with regard to placing the bit; in the former it comes too near the grinders or maxillary teeth; in the latter, the bit either bears on the tusches, or causes humors in the lips. If the lips are too large and fleshy, they cover the bars, and hinder the effect of the bit. When the bars of the palate are too fat and thick, the horse feels the bit

too sensibly; but let it be observed that the palate and gums are less fleshy in old horses than in young: the bars should be raised, and a channel sufficient for containing the tongue within it, and so high as to feel the bit; when too sharp it is a fault, the sensibility being then too great; and if, on the other hand, they are too low, round and fleshy, too little. The tongue should be proportioned to the capacity of the channel in which it is placed; if it projects, or is so thick as to rise above the bars, it is a fault, and hinders the impression of the bit.

The beard is also a part that contributes not a little to the goodness of the mouth. If the two bones which compose it are too distant from each other, and too little prominent, it will, from its flatness, want sensibility, the curb bearing only on one of its sides; but when they are too near each other, and also project too much, the beard is then, on the other hand, too prominent, and consequently too sensible; the curb bearing then only on the middle part. In fine, if the beard be either too hairy, or too fleshy, or if it has any callosities or knobs, they are faults; indicating, that the horse has either too little sensibility, or that proper care has not been taken in riding him.

Ill shaped necks have been distinguished into three principal kinds ; the reverted neck, the false neck, and the inclining neck : the first is also called the stag-neck, being formed like the neck of that animal, and forms a convexity forward from the head to the breast ; the false neck is streight or perpendicular all along the throat, and behind, above the withers, is a cavity, and thence called the hatchet neck ; the inclining neck is that which seems to incline more to one side than the other, occasioned by a superabundance of flesh on one side near the mane.

Thick and bushy manes which overload the neck, and sometimes even make it incline, are very unsightly.

When the withers are too round and fleshy, the shoulders want freedom, and the saddle is apt to rub them, causing very painful and dangerous ulcers ; yet pack-horses, and such as are employed in carrying trusses of forage, should not have the withers too high.

Horses, whose points of the shoulders are large and round, and the shoulders themselves too large and fleshy, are heavy, apt to stumble, and, unless their shoulders have an easy motion, are proper only for drawing. Those which, besides the above defects, have also the joints

joints on each side the breast large and prominent, can only be used in carriages; but there the weight of their shoulders is of advantage, enabling them to draw with the greater force. When they are narrow, and contracted about the shoulders, so that the fore-legs are so close to each other at the top, that they almost touch, the horse is said to be weak forward; and, in travelling, is apt to entangle his legs and fall. Pinned shoulders are those which seem stiff, bound, and motionless. This fault gives a heavy and uneasy motion to a horse, exposes him to stumble, and soon spoils his legs: most saddle horses, which want flesh on their shoulders, are of this kind; though some, even with such shoulders, carry their feet well, the above motion proceeding only from the arm.

A broad and open breast gives a heavy look to large horses; but would not be considered as a defect in those that are slender, the breast in the latter being generally too narrow.

The shorter a horse's back is, the better he gallops on his haunches, but does not walk so well; and the rider suffers from the center of motion being too near the saddle. If the back be long, the horse walks with more ease, having a greater freedom with his legs; but galloping is more difficult to him. A low or saddle

dle back gives a horse lightness, and is an advantage to a fine forehead; his neck is raised, and his head is carried high; but he soon tires, and is unable to carry any considerable weight.

Flat horses are such, whose ribs have not a proper convexity, but seem to hang down; a defect which hinders them from thriving; their belly flags, they are clumsy, short winded, and never have a handsome rump, though their back may be good.

When the belly rises towards the hind-legs, like that of a greyhound, the horse is said to want body, or to be narrow bellied; horses of this kind generally eat little, but are seldom deficient in spirit and mettle.

If the belly hangs below the ribs, and at the same time time is too full, the horse is said to be cow or pot-bellied. If a horse of this kind be young, eats much, and coughs often, it is to be feared that he will soon be broken winded.

Hollow flanks is another deformity; and if the last of the short ribs be at too great a distance from the haunch bone, or does not come low enough, the horse both gets flesh, and loses it when gotten with difficulty. Such a horse, by way of distinction, is said to be too short, or open ribbed.

Horses

Horses in general, when they feel a pain in any part of the hinder train, become thin flanked; when the flanks work more than usual without any great fatigue, it indicates that they are disordered; but if this only happens from a difficulty of respiration when in exercise, the horse is called a puffer; or if the defect be less sensible, thick winded, and is easily distinguished from such where the flank is affected, the throbbing of the flanks ceasing in the puffer whenever he stands still.

Rumps not properly rounded from the reins to the tail, and which, by falling too soon, appear short, are reckoned deformities, and distinguished by the name of plum-buttocks. Those which want prominence and extent behind, are called goose-rumps; and lastly, the mule-rump, where the buttocks are flat; but these are defects of no consequence with regard to the goodness of a horse.

When the bones of the upper part of the haunches are too prominent in a horse, which otherwise is not very lean, he is said to have high haunches; but if very fat, he is said to be cornered. A flat side and low belly generally produce this defect, which always gives the appearance of leanness. If one of the haunches be lower than the other, the horse is said

said to be hip-shot. The conformity of the haunches may be judged of by the situation of the hock ; if too backward, the haunches are too long, and the horse has never any remarkable degree of strength ; if the haunches fall perpendicularly on the pastern joint, they are too short, and hinder the flexibility of the ham.

The tail, when placed too high, renders the rump pointed, and when too low, indicates a weakness in the reins. A horse which closes his tail on your endeavouring to take it up, may be concluded vigorous. Those which have but little hair are called rat-tails, and looked upon as blemished ; as are also those that have short hairs, and those whose tails, instead of forming a convexity at the rump, fall down almost perpendicularly.

A horse having the elbow too much confined by the ribs, turns his leg and foot outward ; if it be too open, that is at too great a distance from the ribs, he turns it inwards ; both are symptoms of debility.

Long legs are the strongest ; short arms the best for motion and the flexure of the leg ; a small arm, besides being unsightly, is a sure indication that the legs want strength.

Large

Large and puffed knees denote the leg to be affected; but, when bare in the middle, a certain proof of it; especially when we have good reason to conclude, that it is occasioned by frequent falls on his knees, and that no other cause has destroyed the hair. A large knee shews a horse to be heavy, when it naturally bends a little forward, so that the shank is not perpendicular; the horse is said to be short armed; a defect, however, which does not lessen the goodness of a horse; but if this fault proceeded from accident, or fatigue, he is said to be crook-legged. Legs do not at first become crooked by fatigue, but are strait on the fore-part from the knee to the coronet, like those of goats, and the horse is said to be goat-legged; but if worked hard afterwards, the legs not being able to stretch any farther, bend, and the horse trembles when he makes a step; though he may still do good service, especially if he has large reins. Calves legs are those which at the knee bend a little backward, and is a fault quite opposite to the former, where the legs bend forward.

In cold and moist countries, if the shank be too slender, it is considered as a mark of weakness in the leg, and should be carefully examined whether there are no swellings on it, as
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these indicate diseases of the bone, which are more or less dangerous, according to their situation. When the back sinew is slender, the horse cannot endure much fatigue, but stumbles, and the leg grows round; that is, the sinew no longer appears detached; a sure indication of disease. It is therefore necessary to draw the hand along the sinew, to see whether it be in its natural state, without tumor or obstruction; if it be but a little distant from the bone, this defect is called a calf leg. In this case the sinew is slender, and the leg will not long continue sound. If the sinew be too small near the knee, it indicates weakness in that articulation; but this is rarely the case.

The pastern joints, when small, are too flexible, and thus subject to swellings called wind-galls; yet horses of this kind go easier, consequently are better for the riding-school and parade, but in carriages good for little; nor can they easily be made to back in passing descents. When the pastern joint is crowned, that is, when it jets out all round more than the hoof, and not caused by any wound or other accident, it indicates the leg to be in a decaying state.

When the pasterns are either too small or too long, and at the same time so ill placed, that the
fetlock

fetlock almost touches the ground, it is a sure indication of weakness; but when this part, tho' long, supports itself in a good position, it is a mark of some strength, especially in the finew, which hinders the fetlock from yielding too much; but the horse is only fit for parade: and in both the above cases he is said to be long jointed, the pasterns, as we have already observed, being also denominated joints. Horses with too short pasterns are called short-jointed: if the knee, the shank, and coronet of these horses, form one perpendicular line, the horse is said to be upright on his legs. Horses of this kind are apt to stumble and fall, and to become fetlocked, especially if the heel be too high. They are also more uneasy to the rider than the long jointed. In some horses one of the sides of the pastern is higher than the other; but this is a slight fault, and easily rectified in the shoeing, as may also that which causes a horse to be upright on his legs. The hair on the pasterns should not be stiff or bristling, especially near the coronet, as it may probably be owing to a farinaceous disease, called the crown scab.

When the coronet is raised above the foot, it indicates that the latter is withered, or the former swelled. This part is very much exposed

posed to accidents from a horse following him, from his own hind-legs striking against the fore, or from frost nails occasionally in his shoes.

A foot too small in proportion to the body, is weak, often painful, and generally accompanied with wire heels. If the heel be of a middling size, and the foot thin, it soon becomes hot on a hard road, and the horse in a short time goes lame. A foot too large, and the hoof and sole thin, is called a fat foot; this is also weak: and horses that have such feet are dull and heavy.

The white hoof is more brittle than that of any other colour, and becomes very troublesome; but is easily perceived, by observing whether it has been broken by the shoe nails. Circled feet are those, where the hoof is hollowed all round by a kind of transversal gutters: this irregularity in the growth of the horny substance proceeds from a heat and dryness in the foot, and often brings on lameness. When any part of the hoof is cut off, it is called a new quarter. This is a deformity, as the new hoof is more rugged, coarse, and soft than the former.

When the quarters are so close, that the hoof, near the fissure of the frog is too narrow; when the heels terminate in a point,

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and are collapsed with each other, the horse is said to be hoof-bound; the heels and quarters thus shaped, press on one of the small bones within the foot, and if they do not render the horse lame, they at least incommode his going. If the heels are long behind, the foot is too long, and subject to be hoof-bound, which may also produce sand cracks; these are fissures in one of the quarters, sometimes extending from the coronet to the lower part of the hoof. Weak heels yield under the pressure; low heels want thickness, and both may produce lameness; the heels in both not having strength sufficient for making a proper resistance.

When the hoof is too large at the bottom, and the quarters project, the horse is said to be flat-footed, and often limps, from the frog bearing on the ground. It is subject to the same inconvenience, and owes its origin to the same cause, as when the horn of the frog is too long; this is called a fat frog, and usually attends low heels. A thin, pinched, small and dried frog, are symptoms of being hoof-bound.

When the sole is too thin it is easily injured when too thick, and projects above the hoof that is, when the under part of the foot is not hollow

hollow, the horse treads on the sole, consequently must hurt himself, and halt; such horses are only useful at the plough.

What has been said with regard to the shank, the fetlock joint, the pastern, the coronet, and feet of the fore-legs, being applicable to the same parts of the hind-legs, it remains only to consider the thigh and the hock.

Lean thighs, in which the thickest part is not well marked, indicate a weakness in the hinder train; when the internal parts of the thighs are too near each other, the horse may be suspected of weakness in those parts.

Small hocks are weak; fat hocks is a name given to those which are not properly void of flesh, and on that account subject to several distempers affecting the legs. When the hocks are too near each other, the hinder parts are weak, though the back may be good. When the hocks are turned too much outwards, it prevents a horse from resting on his haunches, that is, the rump from being lower than the shoulders. Hocks which turn out when the horse travels, always weaken the hinder parts. If the fetlock projects in such a manner that the horse rests only on his toes, it is a fault which increases with age, and is indifferent

only when the horse was so originally, and had it from nature.

The legs are to be considered relatively to each other when the horse stands still. Hence we know if his position be not defective, as the fore-legs may be too much confined at the top, which hinders a horse's going; and, from the legs often touching one another when in motion, the horse may pitch and tumble over. If the hinder feet are placed too forward under the belly, it indicates the horse to be very much tired, as he endeavours to lessen the weight that bears on his fore-legs, by stretching the hinder as far under his body as he is able. When, on the contrary, the hinder feet are placed backwards, so that the root of the tail is not perpendicularly above the hams, but more forward; this situation, though it offends the eye, does not indicate any defect; his haunches may be indeed too long, but this does not hinder his doing his paces well: the hinder train, however, is injured sooner than in a horse of a different shape. If the hock is not placed so backward as it naturally should be, and the haunches, hocks and legs follow the same direction in a right line, the horse moves with difficulty. Another bad position is, for the fetlock joint to project forward,

ward, as if dislocated; horses resting their feet on their toes, instead of treading flat on the sole, stand in a bad posture; and if they turn their hind feet out, want strength in the haunches to go well a on descent; nor can they back but with difficulty.

Horses, which on being stopped, instead of remaining quiet, move their legs alternately, are suspected of being foundered, or worn out with labour, as are also those which place one of the hind legs on the toe; or those which put one of their fore-legs forward, and continue in that posture. These signs, however, are not always certain, being also familiar to some horses which are turbulent and full of fire; and to others these motions and bad attitudes are natural; besides, they may proceed from lassitude, which will even cause some horses to hold one of the fore-legs up, it being nothing uncommon for these animals to rest on three legs; but if they rest one of their hind legs on the toe, and hold one of the fore-legs up, it is an infallible mark that their legs pain them.

These are the principal signs by which the deformities and defects of a horse may be known. I might have added many more, had I not been fearful of incurring a charge of

prolixity; nor should I have given so minute a detail, had it not related to an animal, which it is of the utmost importance to be acquainted with, it being very rare to meet with a horse without some ill qualities, and as difficult not to be imposed upon with regard to their defects. The choice of these animals requires the greatest attention, and they have accordingly been most strictly examined. For I do not think there is any other animal in nature on which there have been so many observations made. All I have advanced concerning the different parts of his body, is only to indicate, from their external appearance, what may be expected from them when in motion. It is in this state that the horse exerts all his strength for our advantage; that he obeys us with equal docility and steadiness; that he serves us with equal subtilty of instinct and courage. Then indeed it is that the most certain judgment can be formed of him, as he is then exercising his good or bad qualities.

A mixture of horses of different breeds produces, in our studs, colts which may all be said to differ in size, proportion, temper, instinct, &c. Amidst this great variety it is that

that horses are chosen for that purpose to which they seem best adapted. Thus very different horses are used for travelling, war, the harness, the pack-saddle, &c. Travelling saddle horses should be in the prime of their age, and of a good size, to support themselves under the fatigues to which they are destined. They should be sure-footed, their feet well made, their hoofs firm, their mouths sensible, and their motions easy; not too fiery, but quiet without sluggishness. The fearful, and those which are too nice in their food, should be rejected. These conditions are requisite in a saddle-horse for riding, but some of them may be dispensed with in a pack-horse; it is sufficient if he be strong and able to carry his load. The mouths of these horses should be as hard as the hand is rough that guides them.

Stone-horses are reckoned most proper for riding post, as they are the most able to endure such fatigues. They must be short punch horses, strong, and sure-footed, and so easy in their gallop that the reins are hardly felt. The greatest danger in them is their going restive or wanton; but the softness of their mouth, and the elegance of their shape, are of no consequence.

All the horses trained up for war should be well shaped, vigorous, alert and lively; their mouths cannot be too good, nor their motions too easy. Their trot and gallop must be short and brisk, their thighs and backs good, &c. The horses used by officers should be good-natured, gentle, dextrous, courageous and active; the fearful, or such as are too delicate, or too fiery, are not fit for this service. With regard to troop-horses, it is sufficient that they are strong, hardy, and good trotters; that they have a good share of foot, and a firm mouth.

In state-horses nothing is attended to but a fine exterior; and accordingly the qualities which chiefly recommend them, are the beauty of their shape, coat, and mane: though it is equally necessary that they should be proud and spirited, their mouth good and frothing, and that they are continually champing the bit. Such as have a proud carriage, have a fine effect in this kind of pomp, where appearances are sufficient.

A horse for taking the air is generally chosen of a middle size, rather small than large, the paces of the former being less fatiguing than the latter. He must be quiet, and do his paces very well. No remarkable vigour is required;

quired ; but a sure foot and good mouth are essential qualities.

Hunters should be fleet, active, vigorous, and long-winded, with a good mouth, though too quick a sensation would prove inconvenient on account of the branches of trees, which sometimes check the bridle. They must also be cool ; for if carried away by the noise of the horn and the dogs, it might prove dangerous to the rider. The horses for the whippers-in may be more clumsy and less valuable, but they must also be swift and vigorous.

Horses for setting and shooting must be trained up to the sport, and not terrified at the firing of a gun. They are generally of the galloway size, for the more easily mounting them. They must be quiet, without any kind of vice. If they walk well, it is sufficient.

Coach-horses should have a good trot, low haunches, strait backs, and an erect head ; a good mouth, their legs nervous, and their feet good.

For post chaises, the shaft horse must be of a good size, well set and long ; trot fast and easy ; the other, on which the driver rides, may be more slender, but his gallop short and easy.

For

For carts, the plough, &c. stone-horses of a common breed, and strongly made, are generally used. As they draw with a collar, there is a necessity for their being well set, their chest large, and their shoulders thick.

Horses for carrying burthens should be well set, with large ribs and firm backs; but the driver's horse should be less clumsy, lighter and more swift, as he often trots.

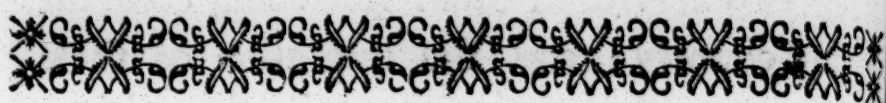
Such are the principal uses of horses, and the principal qualities required in their respective services. Those of a common breed are not less necessary than the most beautiful, or those remarkable for their swiftness, the latter not being able to undergo the labour of tillage and draught. Had we therefore only such horses as are coarse and clumsy, the services they do us in the necessary affairs of life, render them proper objects of our care and attention. If in other respects we despise them, it is only from comparing them with horses foaled in a different climate, and endued with more shining qualities; but such as are often opposite and incompatible with those which are more useful. A naturalist is superior to all these particular views, and considers all horses collectively as individuals belonging to the same species. All breeds coming from different climates

mates

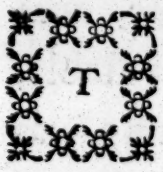
mates must be considered as varieties; the differences observed in them not being constant in any country; and the migration of these creatures, and their mixture in the coition, change and combine them almost *ad infinitum*. But the natural parts essential to the species cannot be altered by any of these variations. All horses resemble each other in every constituent part relative to the species. Consequently whatever be their breed, they are equally proper subjects of our observations relative to the species of horses.

The horse represented on the plate, was drawn from a fine hunter in the king's stable, the spots of a brown bay. The painting was made by M. Oudry, painter in ordinary to his majesty, and copied under his inspection.





T H E
N A T U R A L H I S T O R Y
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 HIS animal, even when examined with attention, and very circumstantially, appears to be no more than a degenerated horse; the perfect similitude in the brain, the lungs, the stomach, the intestinal tube, the heart, the liver, and the other viscera, together with the great resemblance of the body, the legs, the feet, and the whole skeleton, seem to warrant this opinion. The slight differences between these two animals may be attributed to some influence of the climate, and the food, in very remote times; and to the fortuitous succession of several generations of small wild horses, half degeneratd; and which may have insensibly

fibly degenerated still further, till they became degraded as far as possible: thus at length a new species was produced in a settled uniformity, or rather a succession of like individuals, all marked with the same disfiguring particulars, and so different from horses, as to be considered as another species. What appears to countenance this conjecture is, that horses vary much more in the colour of their coats than asses; consequently have longer been rendered domestic; all domestic animals varying much more in their coats than the wild species: that most of the wild horses mentioned by travellers are under-sized, and like asses have a grey coat and bare tail, covered with bristly hairs near the end: and that there are wild horses, and even some that are tame, with the black list on the back; and other marks which still shew some affinity with asses both wild and tame. On the other hand, if the differences of constitution, temper, manners, and the result of those differences; in a word, of the organization of these two animals; and especially the impossibility of mixing them so as to produce a common species, or even a renewable intermediate species, be considered; there seems still more reason to believe that each species of these animals is equally ancient; and that

that the essential difference was originally the same as at present. Because the ass differs materially from the horse in the smallness of its size, the bigness of its head, its long ears, hard skin, bare tail, the shape of its rump; and likewise in the dimensions of the neighbouring parts, the voice, appetite, manner of drinking, &c. Are then the horse and the ass originated from the same stock? Are they as *Nomenclators* *, of the same genus? Or are they not, and have they not ever been, different animals? This question, of which the extent, difficulty, and consequences are easily perceived by naturalists, and which may properly be discussed in this article, has a nearer connection with the production of beings than any other: and, in order to illustrate it, nature must be considered in a new point of view. If amidst the immense variety of all the animate beings which people the universe, some animal, or even the body of man, be selected to serve as the basis of our knowledge, and with which all the other organized beings are to be compared; it will be found that though all these beings exist abstractedly, and all vary
by

* *Equus cauda undique setosa*, the horse; *equus cauda extremo setosa*, the ass.

by differences infinitely graduated, yet at the same time there exists a primitive and general design or model that may be very plainly traced, and of which the degradations are much slower than those of shape, figure, and other external appearances. For, besides the organs of digestion, circulation and generation belonging to all animals, and without which the animal must cease to be an animal, as it could neither subsist nor propagate its species; there is, even in the parts which principally contribute to the variety of exterior forms, a prodigious resemblance, which necessarily reminds us of an original model, after which every thing seems to have been conceived. The body of a horse, for instance, which, at first sight, seems so different from that of a man, when properly compared part by part, instead of surprizing us by the difference, fills us with astonishment at the singular and almost complete resemblance we find between them. For, take the skeleton of a man, incline the bones of the pelvis, shorten the bones of the thighs, legs and arms, lengthen those of the feet and hands, connect the phalanges, extend the jaws, shorten the frontal bone; and, lastly, lengthen the spine: this skeleton, instead of representing any longer the remains of a man, will

will be the skeleton of a horse. It may be easily supposed, that by lengthening the spine and the jaws, the number of the vertebrae, the ribs and teeth are increased at the same time; and it is only in the number of these bones, which may be considered as necessary, and the lengthening, shortening, or junction of the others, that the skeleton of the body of this animal differs from that of the human body. In the foregoing description of the horse, these facts are sufficiently established: but to carry these resemblances still farther, let us separately consider some parts essential to the figure; the ribs, for instance, which will be found in man, in all the quadrupeds, in birds, fishes, and even the vestiges of them may be traced to the very tortoise, where a delineation of them plainly appears in the sutures, under its shell. Let it be considered, as *M. D'Aubenton* has observed, that the foot of a horse, though in appearance so different from the hand of a man, is yet composed of similar bones; and that at the extremity of each of our fingers, there is the same horse-shoe-shaped little bone, which terminates the foot of that animal: let it then be decided whether this latent resemblance be not more astonishing than the visible differences; whether this constant

stant conformity and continuing model, followed from man to quadrupeds; from quadrupeds to the cetaceous species; from them to birds; from birds to reptiles; from reptiles to fish, &c. in which are always found the essential parts, as the heart, the intestines, the spine, the senses, &c. do not seem to indicate that the supreme Being, at the creation of animals, intended to make use only of one model; varying it, at the same time, in every possible manner, that man might equally admire the magnificence of the execution, and the simplicity of the plan.

In this point of view, not only the ass and the horse, but even man, the monkey, the quadruped, and all animals, may be considered as making only one and the same family or genus. But must we then conclude that in this vast and numerous family, which the Almighty alone has called into existence, there are still other smaller families schemed by nature, and produced by time? Some composed only of two individuals, as the horse and the ass; others of several, as that of the weazel, the marten, the ferret, the pole-cat, &c. And also that in the vegetable kingdom there are families of ten, twenty, thirty plants or more. Did these families really exist, they could not have been formed but by the mixture, succes-

five variation and degeneracy of the original species. And if it be once admitted, that there are families among the plants and animals, that the ass and the horse are of the same family, differing from each other only as having degenerated; it may likewise be said, that the monkey is of the same family with man, that it is a man degenerated; that the man and the ape too had one common origin, like the horse and the ass; that each family, both among animals and vegetables, had but one single stock; and that even all animals owe their origin to one single created being; and that their variations were produced during a long series of time, by the improvement or degeneracy of its kind. Naturalists, who so hastily establish genusses in the animal and vegetable kingdoms, seem not to have been sufficiently aware of the whole extent of these consequences, which would reduce the immediate product of creation to a small number of individuals: for if it were once proved that the establishment of these families was right; were it granted that in the animals, and even in the vegetables, there was, I will not say several species, but one only, which had been produced by the degeneracy of another species: were it true, that the ass was no more

that

than a horse degenerated, there would no longer be any limits to the power of nature: and it might be supposed, in process of time, to have been able to have produced all organized beings from one single original.

But no; it is certain from revelation, that all animals have equally shared in the favour of creation; that the two first of each and of every species, came completely formed from the hands of the Creator: and it is natural to believe, that they then nearly resembled their present descendants. Besides, since observations have been made on nature, from the time of *Aristotle* to the present, no new species have appeared. Notwithstanding the rapid motion which hurries along, collects or disperses the parts of matter: notwithstanding the infinite number of combinations that must have occurred during these twenty centuries: notwithstanding the casual or compulsive copulations of animals of distant or neighbouring species; the result of which has always been defective and barren individuals, incapable of becoming the parents of new generations. Were there a resemblance, both external and internal, between some animals, still greater than that between the horse and the ass, it would no more warrant us to confound these

animals in the same species, than to attribute to them one common original. For had they proceeded from the same stock, were they in reality of the same species, they might be again allied: they might be coupled together, and thus what time had done, might in time be undone. Let it be farther considered, that though the progress of nature be by gradations and changes often imperceptible, yet the intervals between these gradations or changes are so far from being all equal, that the more noble the species, the less numerous they are; and the intervals of the changes that separate them the larger: that the smaller species, on the contrary, are very numerous; and, at the same time, at a less distance from one another. And thus we are induced to confound them together in one and the same family, that the multitude and minute differences which burden the memory may not perplex us, and put us to greater trouble: but let us not forget that these families are our own work, formed only for the ease of our own minds; that if we cannot comprehend the real series of all beings, it is our fault, and not that of nature, which disowns these supposititious families; being in reality only individuals.

An individual is a Being apart, insulated or detached, and which has nothing in common with other Beings, but that it either resembles them, or differs from them; all similar individuals existing on the surface of the earth are considered as composing the species of such individuals; yet it is neither the number nor collection of similar individuals that make the species. This is constituted by the regular succession and uninterrupted renewal of these individuals. For a Being that should continue for ever, would no more constitute a species, than a million of similar Beings also of perpetual existence. Thus *species* is an abstract and general name for a thing which exists only by considering nature in a succession of time, and the constant destruction, and equally constant renewal of Beings: it is by comparing the present productions of nature with those of former times, and the individuals now existing, with those individuals which existed in past ages, that we have acquired an adequate idea of what is called species; and the comparison of the number, or similitude of individuals, furnishes nothing more than accessory ideas, which are often independent of the former. For there is a nearer resemblance between the ass and the horse, than between the spaniel and

greyhound ; yet the spaniel and greyhound are but one species, as they produce together individuals capable of producing others : whereas the horse and the ass are of different species, because they produce together only such individuals as are defective and barren.

It is therefore in the characteristic diversity of the species, that the intervals of the gradations of nature are most sensible and most distinct. These intervals between the species may even be said to be, of all others, the most equal, and the least subject to variation ; because a line of separation may always be drawn between two species ; that is, between two successions of individuals, as producing themselves, and incapable of mixture ; as in one single species, two successions of individuals, reproducing themselves by an intermixture, may be united. This is the most fixed point known in natural history ; all other similitudes and all other differences, which we might discover by comparing Beings, would be neither so constant, so real, nor so certain. Accordingly these intervals will be the only lines of separation found in our work. We shall divide beings no otherwise than they are in reality ; each species, each succession of individuals which reproduce each other, and cannot mix, shall be considered

considered apart, and separately treated. And with regard to families, genuses, orders, and classes, we shall make no other distinctions than those which have been made by nature.

The species being then only a constant succession of similar individuals reproducing each other, it is plain that this denomination should be limited to animals and vegetables; and that *Nomenclators*, in extending it to denote the different sorts of minerals, have misapplied the word, or mistaken the idea conveyed by it; that iron is not to be accounted one species, and lead another, but two different metals; and in our discourse on minerals it will be seen, that the lines of separation which we shall use in the division of mineral substances, are very different from those used by us for animals and vegetables.

But to return to the degeneration of beings, and particularly to that of animals, let us more closely observe and investigate the operations of nature, in forming the varieties which it presents to our view; and the human species being best known to us, let us see how far these marks of variation extend. *Men differ from white to black, from compound to simple by the height of stature, bigness, activity, strength, &c. and from the*

greatest to the least by the intellect. But as this last quality is foreign to matter, it does not come under consideration here. The others are the ordinary variations of nature, proceeding from the influence of climate and food: yet amidst all these differences of colour, and dimensions, the *Negro* and the white man, the *Laplander* and the *Patagonian*, the giant and the dwarf, can together produce individuals capable of reproducing themselves: and consequently these men, so different in appearance, are all of one and the same species; this constant reproduction being what constitutes the species. After these general variations, there are others more particular, and which are also perpetuated; as the enormous legs of those men called the progeny of *St. Thomas*, in the isle of *Ceylon*. The red eyes and white hair of the countries of *Darien* and *Chagre*; the six fingers and toes of certain families, &c.* These singular varieties are accidental defects or excesses, which first happening to some individuals, have, like the other hereditary distempers and defects, been propagated through successive generations.

* See this curious observation in *M. Maupertius's* letters, where are also very elevated philosophical speculations on generation and other subjects.

But these differences, though constant, are to be considered only as individual varieties, which do not separate these individuals from their species; for the extraordinary progeny of those thick-legged or six-fingered men may copulate with the common race, and produce individuals, which reproduce others resembling themselves. The same thing may be said of all other deformities and irregularities communicated by parents to their children. Thus far the errors of nature often extend; but these are the utmost limits of its varieties in man; and if there be individuals which degenerate still farther, those individuals, as they reproduce nothing, cannot alter or destroy either the unity, or the constancy of the species. Thus there is in man but one and the same species: and though this species may be probably more numerous, and abundant in individuals, and at the same time the most uncertain and irregular in all its actions; it is not found that this prodigious diversity of disposition, nourishment, climate, and so many other imaginable combinations, has produced Beings so different from others, as is sufficient to form new species; and at the same time so similar to us, as to prove, that all have descended from the same original.

If

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If the *Negro* and the White could not propagate their species together; or even if their progeny were barren; if the *Mulatto* were in effect a mule, there would then plainly be two distinct species: the *Negro* would be to the man what the ass is to the horse; or rather, if the White were male, the *Negro*, instead of being one of the human species, would be, like the monkey, a different animal; and there would be sufficient reason to conclude, that the White and the *Negro* had not one common origin. But this is a supposition contradicted by experience; and as every race can communicate and produce together, it is plain that all men came originally from the same stock, and are of the same family.

It is nothing strange that two individuals should not be able to propagate their species; because nothing more is required than some slight opposition in their temperaments, or some accidental fault in the genital organs of either of these two individuals. Nor is it surprising that two individuals of different species should produce other individuals, which being unlike either of their progenitors, bear no resemblance to any thing fixed, and consequently cannot produce any thing resembling themselves; because all that is requisite in this
pro-

production, is a certain degree of conformity between the form of the body and the genital organs of those different animals. But what an immense, and perhaps infinite number of combinations are required, only to found a supposition, that two animals, male and female of a certain species, are not only so far degenerated, as to be no longer of that species; that is, no longer able to produce Beings which they once resembled; but also that they have both precisely degenerated to the same point, and to that very point which was necessary for their being capable of propagation. And what a prodigious immensity of combinations is afterwards necessary, that the new production of these two degenerated animals may exactly observe the same laws which regulate the production of perfect animals; for a degenerate animal is itself a vitiated production: and how should a vitiated origin, a depravation, a negation, become the stock of a family, and not only produce a succession of constant beings, but even produce them in the same manner, and according to the same laws observed in the reproduction of animals of a pure origin?

Thus if it cannot be demonstrably proved, that the production of a species by degeneration

tion is a thing impossible to nature ; the number of opposite probabilities is so immense, that it can scarcely be doubted with the least appearance of reason : for if some species have been produced by the degeneration of the other ; if the species of the ass came originally from the species of the horse, it must have been done successively, and by gradation : between the horse and the ass there would have been a great number of intermediate animals, the first of which would have deviated almost insensibly from the nature of the horse, and the last gradually assimilated the form and constitution of the ass. And why should we not at present see the representatives, the descendants of these intermediate species ? Why are the two extremes only remaining ?

The ass therefore is an ass, and not a horse degenerated ; a horse with a bare tail. He is neither an alien, a mongrel, nor a bastard ; but like all other animals has his family, his species, and his rank. His blood is pure, and if his family be less illustrious, it is at least as genuine and as ancient as that of the horse. Why then should this creature, so mild, so patient, so sober, and so useful, be so much despised ? Do men, even in animals, contemn
those

those that serve them too well and too cheaply? The horse is trained up, great care is taken of him, he is instructed and exercised; while the poor ass is left to the brutality of the meanest servant, and the wantonness of children; that so far from improving, he must be a loser by his education: and indeed, had he not a large fund of good qualities, the manner in which he is treated is sufficient to exhaust them. He is the sport, the butt, the drudge of clowns; who, without the least thought or concern, drive him along with a cudgel, striking, overloading, and tiring him. It is not remembered, that, if there were no horses, the ass would be considered, both with regard to himself and us, as the most useful, most beautiful, and most distinguished of animals. Instead of being the first, he is now the second; and from this accident alone he seems to be held in no estimation. It is the comparison that degrades him: he is considered not in himself, but relatively to the horse. We forget that he is an ass; that he has all the qualities of his nature, all the gifts annexed to his species; and think only on the figure and qualities of the horse which are wanting in him, and which it would be improper for him to have.

By

By his natural temper he is as humble, as patient, and as quiet as the horse is proud, fiery, and impetuous; he bears with firmness, and perhaps with courage, blows and chastisements. He is sober, both with regard to the quantity and quality of his food, contenting himself with the most harsh and disagreeable herbs, which the horse and other animals will not touch. In water he is very nice, drinking only of that which is perfectly clear, and at brooks with which he is acquainted. He is equally temperate in his drinking as in his eating, and does not plunge his nose into the water, from a fear, it is said, of the shadow of his ears.* As he is not thought worth currying, he often rolls himself on the grass, on thistles or fern; and, without minding his load, he lies down to roll as often as he has an opportunity, tacitly reproaching his master with the little care taken of him: for instead of weltering like the horse in mud and water, he is even careful of wetting his feet, and turns aside to avoid any dirt. Accordingly his legs are drier, and more cleanly than those of the horse. He is susceptible of education; and some have been trained in such a manner, as to be shewn for a curiosity.

* See *Aldrovand* de quadruped, Solidip. lib. I. p. 308.

In his early youth he is sprightly, and not void of beauty, agility, and good humour. But, either through age or ill treatment, he soon loses these good qualities, and becomes sluggish, untractable and obstinate; eager only for pleasure, or rather so mad after it, that nothing can with-hold him; nay, some have been known so violent, as to die within a few minutes after copulation: and as his love is a kind of frenzy, so he has also the strongest affection for his issue. *Pliny* assures us, that if the dam be separated from her foal, fire itself cannot deter her from attempting to regain it. The ass is also fond of his master, though usually more than he deserves: he smells him at a great distance, and distinguishes him from every other man: he also knows again the places where he has been used to live, and the roads which he has travelled. Besides the goodness of his eyes, his smell is surprizing, especially with regard to the effluvia of the she ass: he is very quick of hearing, which has contributed to his having been ranked among the timid animals, who are all said to have long ears, and to be very quick of hearing. When overloaded, he hangs down his head, and drops his ears; when too much vexed, he opens the mouth and draws back

back his lips in a very disagreeable manner, which gives him a sneering and derisory aspect. On his eyes being covered he stands motionless; and when lying on his side, if his head is placed in such a manner that one eye rests on the ground, and the other eye be covered with a stone, or piece of wood, he will lie in that posture without shaking himself, or making any motion to get up. Like the horse he walks, trots and gallops; but all his motions are short, and much slower. If at first he runs with some swiftness, he soon gives over; and whatever pace he takes, if hurried, he is immediately jaded. The horse neighs, and the ass brays; which is done by a very long and very disagreeable and discordant cry, through alternate dissonances, from the grave to the acute, and from the acute to the grave. He hardly ever makes this noise but when stimulated by lust or hunger. The voice of the she ass is more clear and shrill. After castration the braying of an ass is much weaker; and though he seems to make the same efforts, and has the same motions with the throat, his cry does not extend to any great distance.

Among all hairy animals, the ass is the least subject to vermin. He is never troubled with lice, probably owing to his hard dry skin; which

which is indeed harder than that of most other quadrupeds; and this also renders him less sensible than the horse, to the whip, and the stinging of flies.

At the end of two years and an half he sheds his foal-teeth, and next the other incisores, which drop out, and are renewed in the same order as those of the horse. The age of the ass is also known by the teeth; and the third of the incisores, on each side, are denoted as in the horse. An ass is capable of generating so early as at the age of two years. The female is even sooner ripe than the male, and full as lascivious; and for this reason she is a bad breeder, ejecting again the seminal fluid she had just received in coition, unless the sensation of pleasure be immediately removed by loading her with blows, the only method of preventing the consequence of her amorous convulsions. This is a precaution, without which she would very seldom retain. The most usual time of her heat is the month of *May* and *June*. After pregnancy, her heat is soon over, and in the tenth month the milk appears in her teats. In the twelfth month she foals; and often in the fluid of the aminos are found solid lumps, like the hypomenes of the foal. Seven days after parturition the heat

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returns,

returns, and the she afs is again fit to receive the male; so that she may, as it were, be continually kept engendering and nourishing her young. There is hardly any instance of her having two foals at a time. At the end of five or six months the foal may be weaned; and, if the dam be pregnant, it is even necessary that the foetus may have proper nourishment. A stallion afs should be chosen among the largest and strongest of his species. He must be at least three years old, and not exceed ten. His legs long; his body full; his head erect and airy; a lively eye, large nostrils, the neck longish, the breast broad, the back fleshy, the ribs broad, the rump flat, the tail short, and the pile glossy, soft, and of a dark grey. The afs which like the horse, is three or four years growing up, lives also, like that animal, twenty-five, or thirty years: but the females are generally said to be longer lived than the males: a consequence, perhaps, owing to their being a little more tenderly used, as often pregnant; whereas the males are worked, and beaten without intermission. They sleep less than horses; and if ever they lie down to sleep, it is when they are quite spent with labour. The stallion afs also lasts longer than the stallion horse; his eagerness
seems

seems to increase with his age; and in general the health of this animal is much more steady and confirmed than that of the horse. He is far more hardy, and subject to a much less number of distempers. Even the ancients mention few, except the glanders; and this, as we have already observed, is very rare.

Among the asses, as among the horses, are different breeds; but less known, from the different attention bestowed on the two animals; but it can scarcely be doubted that they all came originally from hot climates. *Aristotle* * affirms, that in his time there were no asses in *Scythia*, nor in the other northern countries contiguous to *Scythia*, nor even in *Gaul*, where, he says, the climate is something cold: and adds, that a cold climate either disables them from propagating their species, or causes them to degenerate; and that, from the latter cause, those found in *Illyrium*, *Thrace*, and *Epirus* are small and weak: they are however still the same in *France*, though long since naturalized; and the cold of the climate is very much diminished during the last two thousand years, by cutting down great numbers of forests and draining many marshes. But what appears still more certain is, that in *Sweden* and

* See *Aristot. de generat. animal, lib. II.*

other northern countries, they are but recently known.* They seem originally to have come from *Arabia*, and thence to have passed into *Egypt*, from *Egypt* into *Greece*, from *Greece* into *Italy*, from *Italy* into *France*; and afterwards into *Germany*, *England*, and lastly into *Sweden*, &c. For in reality, the colder the climates, the weaker and smaller the asses are.

This migration does not want for proofs among the accounts of travellers. *Chardin*† says, that there are two kinds of asses in *Persia*; the native asses, which are slow and heavy, and used only for carrying burthens; and a breed of *Arabian* asses, which are very pretty beasts, and the finest of this species in the world. They have a smooth coat, carry their head well, are slender legged, lift up their feet briskly, and walk well: these are only used for riding. The saddles put on them are like round pack-saddles, and flat above; the bridle, stirrups, and other furniture, are of cloth or tapestry. The rider sits nearer the rump than the neck: some of these asses sell for near twenty pounds, and under twenty-five pistoles none of them are to be had. They are treated like the horses; but all that is

* See Linnæi Faunam Suecicam.

† Tom. II. p. 26 and 27.

taught them is to amble; and in order to this, they tie the fore and hind-legs of the same side together, with cotton lines, at a greater or less distance asunder, in proportion to the step the creature is to make in ambling. These lines are suspended by another fastened to the girth at the place of the stirrup: a sort of grooms ride them morning and evening, and habituate them to this pace. Their nostrils are split for giving them more wind; and they go at such a rate, that there is no keeping up with them but on a gallop.

Can the *Arabians*, among whom it has been so ancient a custom to be remarkably careful of the breed of their horses, be supposed to have taken the same pains with their asses? Or does not this seem rather to prove that the climate of *Arabia* is the very best for both? They were thence imported into *Barbary* * and *Egypt*, where they are very large and handsome, as they are in all the very hot climates, as the *Indies* and *Guinea*; † where they are larger, stronger, and better than the country horses. They are greatly honoured at *Madura*, ‡ and even particularly revered by

* See *Shaw's travels*, Book I. p. 308.

† See *Voy. de Guinee de Bosman*, *Utrecht*, 1705, p. 239 and 240.

‡ See *lettres edifiantes*, douzieme recueil, p. 96.

by one of the most considerable and noble *Indian* tribes, from a persuasion that the souls of all the nobility transmigrate into the bodies of asses. In fine, in all the southern countries, from *Senegal* to *China*, a greater number of asses are found than horses; wild asses are also more common than wild horses. The *Latins*, in imitation of the *Greeks*, call the wild ass *Onager*, which must not, as with some naturalists and many travellers, be confounded with the *zebra*. The onager, or wild ass, is not striated like the zebra, and its figure far less elegant. Wild asses are found in some of the islands of the *Archipelago*, and particularly in *Cerigo*.^{*} They abound in the deserts of *Libya* and *Numidia*. They are grey, and so fleet, that only the *Barb* horses can equal them. At the sight of a man, they set up a cry, throw out their heels, and stop, not betaking themselves to flight till he approaches very near them. They are taken in snares and toils. They feed in troops, and also drink together; their flesh is eaten. In the time of *Marmol*, whom I have just quoted, there were also wild asses in the island of *Sardinia*, but smaller than

* See *Dapper's* collection, p. 185, 378.

† See *Leo. Afr. de Afr. descript.* tom. II. p. 5, and *l'Afr. de Marmol*, tom. I. p. 53.

those

those of *Africa*. And *Pietro della Valle* says,* that he saw a wild ass at *Basora*, whose shape not at all differed from that of the tame: the colour only was lighter, with a list of flaxen hair from the head to the tail. He was also a great deal more sprightly and swift than the common asses. *Olearius* † relates that the king of *Persia* one day took him up with him into a little edifice, in the form of a stage, to a collation of fruits and sweet-meats. After the entertainment, thirty-two wild asses were brought in, on which the king fired a few shot, and discharged some arrows; afterwards he permitted the ambassadors and other lords to shoot; that it was no small diversion to see these asses, some of them pierced with more than six arrows, with which they wounded others by mingling with them; so that they attacked one another with the greatest fury: and that when they had been all killed, and laid in a row before the king, they were sent to the court-kitchen at *Ispahan*, the *Persians* accounting the flesh of these asses so great a dainty, that it is become a proverb, &c.

* See *Voy. de Pietro della Valle*, tom. VIII. p. 49.

† See *Voy. of Adam Olearius*, tom. I. p. 511.

But there is no reason to think that these thirty-two wild asses were all taken in the forest; they were, in all probability, bred with many others in large parks, for the pleasure of hunting and eating them. Neither asses nor horses were found in *America*, though the climate, especially that of the southern parts, agrees with them as well as any other. Those carried over thither by the *Spaniards*, and turned loose in the large islands, and on the continent, have increased so considerably, that in several places wild asses are seen in troops; and are taken in toils, like wild horses.*

The ass and the mare produce the larger mules, while the horse and the she-ass produce the smaller; which in several respects differ from the former: but this is not a place to treat particularly of the generation of mules. We shall therefore conclude the history of the ass with enumerating his qualities, and the uses to which he may be applied.

Wild asses being unknown in these climates, we cannot pretend to determine, whether their flesh be really proper for food: but it is certain that the flesh of domestic asses is far from being so. It is worse, tougher, and more dif-

* See *Nouv. Voy. aux isles de l'Amerique. Paris, 1722, tom. II. p. 293.*

agreeably insipid than that of horses. *Galen** says, that it is a noxious food, and productive of distempers. Asses milk, on the contrary, is a known specific in certain diseases; and as such was used by the *Greeks*. To have it good, the she-ass must be young, sound, in good case, one which has lately foaled, and not been covered since. The foal she suckles must be taken from her: she must be kept clean, fed well with hay, oats, barley, and salubrious herbs, whose qualities are adapted to the distemper. The milk must not be suffered to grow cold, or even exposed to the air, as it would by that means be immediately spoiled.

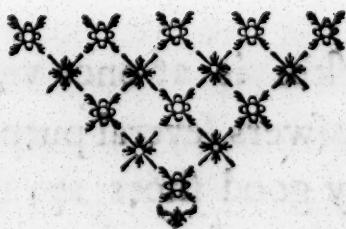
The ancients also attributed many medicinal virtues to the blood, urine, &c. of an ass; and other specific qualities to its brain, heart, liver, &c. But experience has overthrown, or at least not confirmed, what they have delivered on this head.

As the ass's skin is at once very hard and very elastic, it answers several purposes. Sieves, drums, and very good shoes are made of it; and also a thick sort of parchment for pocket-books, laid over with a thin coat of plaister. It is also with ass's leather that the orientals make the sagri, called by us † shagreen. Pro-

* See *Galen* de aliment. facult. lib. III.

† See *Thevenot's* travels, tom. II. p. 64.

170 THE NATURAL HISTORY, &c.
bably the bones, as well as the skin of the afs,
are also harder than the bones of other ani-
mals; the ancients making flutes of them, and
found them more sonorous than any other
bones. The afs can probably carry a greater
load, in proportion to his size, than any other
animal: and as the feeding him costs little
or nothing, and he requires hardly any care,
he is very serviceable in the country for a
mill, &c. He may also serve for riding, all
his goings being easy; and at the same time
he is much less subject to stumble than the
horse: in countries of a light soil he is often
put to the plough; and for strong or moist lands
his dung is an excellent manure.





DESCRIPTION

OF THE

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THE ass is easily distinguished at first sight from the horse. These animals are never taken for each other; even though we should see two exactly of the same size, and of the same colour. However, by minutely examining the different external parts of the body of the ass, and comparing them with those of the horse, we find in most of these parts so remarkable an agreement, and such a perfect resemblance, that we are surprized at the sensible difference between the total connection of these similar parts in the ass and the horse. Thus, on opening the body of an ass, displaying his viscera, and clearing his skeleton, we think we see in them all the internal parts of a horse. If the internal parts only

only of these two animals be considered, the more they are viewed, and the more they are compared with one another, the more we are tempted to take them for individuals of the same species: and even the small differences found between some of the exterior parts would prove nothing to the contrary. For the specific marks commonly attributed to the ass, as its being smaller, its ears and tail longer, and the mane shorter than the horse, and its tail being bare of hairs only at the end, are not essential marks. We find great differences in different breeds of other animals.

Between the size of the largest horses and that of the smallest asses, there is not that disparity as between a mastiff and a little *Danish* dog; the ears of the wolf-dog are shorter, when compared to those of a terrier, than a horse's ears are in comparison of those of the ass. Besides, the ears of the wolf-dog are erect, and those of the terrier pendulous; a difference which does not exist between the horse and the ass. In the shag-dog and spaniel the hairs of the neck are remarkably long, and in the greyhound and *Dane* remarkably short; an inequality greatly exceeding that between the manes of the ass and the horse. Is there not a greater difference in the tails of dogs,

dogs, than between those of the horse and ass? Especially if this part be considered in dogs, relatively to its direction and curvature; and also with regard to the hair which covers it. In fine, is there not a greater external similitude between the horse and the ass, than between a *Turkish* dog and a spaniel? or between the terrier and the greyhound?

The ass copulates with the mare; and the horse with the she-ass. Indeed the congruities between the genital parts of these two animals are so many, that it is not strange their copulation should be prolific; but in the produce is found an essential difference. Mules perfectly resemble neither horses nor asses, not being able to reproduce themselves, as dogs produced by the mixture of several breeds, in whatever manner they are combined: and even when the extremes are brought together, by causing the largest to couple with the smallest; consequently the analogy is more complete between dogs, in appearance more different than between the ass and the horse; though the best matched for size, and all the parts of the body, even if a horse could be found with very long ears, a very short mane, part of the tail naturally bare, and other externals of an ass.

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There is no necessity for the terms used by horsemen in distinguishing the colours of the coat, which in the ass are not near so various as in the horse; and the common denominations of colours are abundantly sufficient to explain them. The most common colour in the ass is the mouse-grey. There are also the glossy greys, and greys mixed with dark spots. Besides these, some asses are of a dun colour, some brown, and others black. The grey asses have a white muzzle, extending about four inches above the nostrils; and this white spot is generally terminated at the upper part with a streak of a dun colour. The extremities of the lips are black, together with the space between the upper lip and the nostrils; but some individuals have only two black streaks reaching from the extremity of the upper lip to the nostrils. The ears are edged with black, and appear as if speckled with that colour on the external surface, and the tip of the ear; the rest is a mixture of grey and dun. It has a long black list, extending from the fore-top, all along the mane and the back, following the vertebral bone in its whole length, and down the tail to its extremity. Another list of the same colour crosses the former at the withers, and descends on each side

side to near the middle of the shoulder. The fore-part of the above list runs along the upper part of the middle of the fore-top and mane; both are black; and this is also the colour of the hair on the inner part of the tail. In most of the grey asses, the knee, the fetlock, the pastern, and the coronet of both the fore and hind-legs are brown, or black. Some have a blackish semi-circle on the middle of the fore-part of the fore-legs, and on the upper part of the shank of the hind-legs. Others have two semi-circles of the same colour, about an inch distant, on the fore-part of the fore-leg, but this is very seldom seen; the lower part of the fore-leg being generally marked with brown or black, in form of rings. The inside of the ears, the throat, the breast, belly, flanks, and inward parts of the arms and thighs, are white in almost all asses, be their colour what it will; or if not white, they are at least of a lighter colour than the other parts of the body. Most asses have also a white or whitish circle round the eyes, and the external limits of this circle is generally of a ruffet colour, vanishing gradually. The brown and dun asses, like the grey, have also some black on their ears; but the middle of the face is of a fainter colour than the rest of the body.

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There is reason to believe that grey is the most natural colour of asses, or at least grey mixed with some tincts of a fallow colour; and that if we had wild asses, they would resemble the grey ones above described, having some black spots or streaks on a grey ground, and a few tincts of orange. With these three colours might be formed all the gradations and tincts found in the coats of asses, even those that differ the most in colour. And doubtless this variety might be encreased by greater care in the choice of stallions used in the production of individuals; but these creatures, especially in our country, are very much neglected. If they do but travel well, tread sure, and carry heavy burdens, not the least notice is paid either to the colour of their coat, the spots on the general colour, nor the feathers formed by a certain arrangement of the hair, as in the horse: though some asses are found with white spots, and others with stars in their foreheads; but the white line of the star joins with the white on the muzzle. They all, or at least all that I have seen, have in the middle of the star a feather; and most have two feathers behind the mane, near the ears, one on each side. The hair of the ass is, in general,
more

more harsh and firm, and, at the same time, longer than that of the horse.

The proportion of the several parts in the bodies of asses is little minded, those only being rejected whose defects clash with the use for which they are designed, and even these defects must be very apparent; such as sore or crooked legs, which render the creature weak, or subject to stumble; or the back concave through the whole length: such a formation of the spine being less proper for bearing burdens than the convex. These animals not being used for shew, but generally for the hardest labour; no care has been taken to perpetuate those of the best shape, nor has any rule been so much as agreed on for knowing those which are the best proportioned in all parts of their body. I make no difficulty of imputing the cause of this forgetfulness to horses; and were there none of that species, the same care and precision would be used in finding out and determining in what the beauty and elegance of the shape of the ass consists, as there have been in that of the horse; as we should have been obliged to have employed asses in most of the works now performed by horses. The rules which have been laid down for settling the beautiful proportions, or the

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deformities and defects of the different parts of the body of the horse, are not at all adapted to the ass; especially those which regard the head, neck, back, haunches, rump, &c. on account of the many differences which result from comparing these parts in an ass with those in a horse. There is, however, a much nearer agreement between the other parts of these two animals, especially in the legs; though all that has been said of the horse's legs, is not to be strictly applied to those of the ass. It has been seen in the foregoing history of the ass, that the shape and stature varies in different climates. I measured a well proportioned, middle sized ass of this country, and the dimensions of the external parts of the body were as follows. From between the ears to the anus, it measured four feet and a half in a right line; it was ten hands and half an inch in height, from the bottom of the fore-feet to the top of the shoulders; and ten hands two inches and a half from the bottom of the hind feet to the top of the rump. The length of the head, from the end of the lips to the occiput, was one foot six inches; which being added to the length of the neck and body as far as the origin of the tail, give six feet for the whole length between the muzzle and the anus.

anus, which could not be measured without two dimensions, because the animal being still alive, would not easily lift up his muzzle high enough to take away the curve formed at the back part of the head, that this distance might be measured in a right line.

The muzzle contained between the end of the nostrils and the extremity of the lips, was a foot and two inches in circumference. The contour of the opening of the mouth, measured on the lips, was nine inches in length: the nostrils were a little farther from each other, at the upper than at the lower parts. The distance between the anterior angle of the eye, and the extremity of the lips, was ten inches and a half; and that between the posterior angle and the ear four inches and a half. The length of the eye from one angle to the other was one inch five lines, and the aperture eight lines; that is, the distance between the eyelids when the eye was open, was eight lines. The distance between the anterior angles of both eyes was six inches and a half, measuring along the curve of the star; but only four inches five lines in a direct course. The circumference of the head, taken a little below the ears, was two feet five inches; the length of the ears was eight inches and a half, and

their bases five inches nine lines in breadth, measured on their external curves. The two ears at the lower parts were four inches distant.

The neck, from the head to the shoulders, was about a foot in length; the circumference of it, near the head, one foot eleven inches; it was nine inches from the base of the mane to the throat; two feet three inches in circumference near the shoulder, and eleven inches in breadth. The circumference of the body, taken just behind the fore-legs, was three feet eight inches; in the middle, at the thickest part, four feet five inches; and just before the hind-legs, three feet nine inches. The distance between the lower part of the belly and the ground, was one foot eleven inches. The dock of the tail was one foot two inches in length, and, at its origin, half a foot in circumference.

The length of the arm was eleven inches and a half, from the cubit or elbow to the knee, and the circumference, near the elbow, a foot and half an inch, and near the knee eight inches. The protuberance caused by this articulation was three inches long, and nine inches in circumference. The length of the shank was six inches, and its circumference the same; that of the fetlock was seven inches and a half. The length of the pastern was about

about two inches, and its circumference near five; that of the coronet was ten inches. The distance from the ground to the middle of the knee was thirteen inches and a half; that between the elbow and the withers, one foot four inches and a half; and that between the elbow and the lower part of the foot, two feet two inches. The two arms at the top, near the belly, were four inches asunder; and the feet five inches. The fleshy part of the thigh, from the stifle to the hock, was one foot two inches and a half; and its circumference, near the belly, one foot eight inches. The breadth of the hind-leg measured from the fore to the back part above the hock, was four inches; and the circumference nine and a half. The shank, from the ham to the fetlock, was eleven inches in length, and its circumference six and a half; that of the fetlock was eight inches. The pastern was two inches in length, and the same in breadth. The circumference of the coronet was nine inches and a half. The distance between the lower part of the foot and the hock, was one foot four inches.

The hoof was five inches in length from the toe to the heel; and three inches in breadth from one quarter to the other: three inches three lines in height at the fore-part; about

ten inches circumference near the coronet, and twelve at the lower part.

On comparing the afs with the horse in regard to shape and attitude, it appears, at first sight, that the head of the afs is much larger in proportion than that of the horse; that his ears are a great deal longer; his forehead and temples covered with much longer hair; his eyes less prominent; the under eye-lid more flattened; his upper lip more pointed, and as it were hanging; his neck thicker; his withers less raised; and his chest more contracted, and hardly discernible from his throat. The back is convex, and, in general, the spine through its whole length to the tail elevated. The haunches higher than the withers, the croup flat and sunk; and lastly, the tail bare from its origin to about three fourths of its length. In other respects the afs has a great resemblance to the horse, especially in the fore-legs; but the hind are in general crooked, and very close behind.

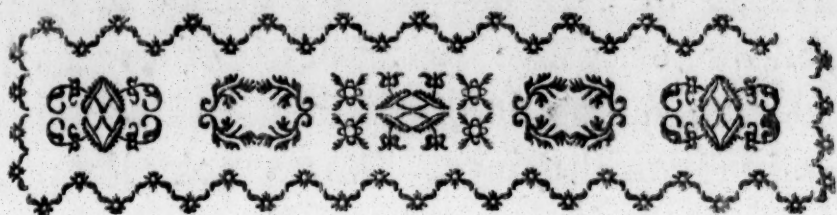
Instead of the air of good humour and docility, so pleasing in the horse, the large head of the afs, the long and thick hair which cover its forehead and temples; its hollow eyes, and their distance from each other, with the muzzle swelling towards its extremity, give the
afs

ass a look of heaviness and stupidity. The lower part of the ass's head, reaching from the eyes to the extremity of the lips, is not equal in length to that of the horse, in proportion to the space between the eyes and the ears. Nor is this excess only in length, it is also wider and flatter. Besides, the ears being longer, more vacillating, and hanging lower, give the ass a heavy stupid look; while, by the differences we observed in these parts of the horse, the latter acquires an air of elegance and sagacity. The heavy head, the long flabbing ears, the large and thick neck, the contracted chest, the arched and sharp back, the haunches being raised above the withers, the flattened croup, the bare tail, and crooked hind-legs, altogether render the appearance of the ass mean and contemptible.

These defects have a bad influence in its gait, and all its paces, especially when compared with those of the horse. But setting aside this object of comparison, which so far debases the ass, it would be preferred to all our domestic animals for riding, and many other uses; and perhaps, when by making a proper choice of stallions, during a long series of generations, and carefully training the foals, it is brought to all possible perfection, it might serve for the

same purposes as the horse. Beautiful proportions would be discovered in the shape of the ass; the lightness and variety of its paces would be extolled; the good qualities of its natural instinct would be admired, when compared with the heaviness and ferocity of the bull; which, in want of horses, would, with the ass, be the only domestic animals used for riding. But by this supposition, I do not intend to rescue the ass from that contempt in which he is held, nor place him on a level with the horse: I would only observe, that in the eyes of a naturalist, the ass is an animal no less considerable, nor less worthy investigation than a horse. The external parts of his body, taken separately, or considered relatively to the whole, are wonderful, though less elegant than those of the horse.





THE
NATURAL HISTORY
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THE surface of the earth, decked in
its verdure, is the inexhaustible and
common source from whence man
and beast derive their subsistence: whatever
lives in nature, lives on what vegetates; and
vegetables, in their turn, live on what-
ever has lived and vegetated. It is impossible
to live without destroying; and indeed it is
only by the destruction of beings that animals
can subsist themselves, and propagate their
species. God, in creating the first individual
of each species of animal and vegetable, has
not only given a form to the dust of the earth,
but

but has rendered it living and animated, by inclosing in each individual a greater or lesser quantity of active principles, of organical molecularæ, living, indistructible, and common to all organised beings. These molecularæ pass from body to body, and equally contribute to present life, and the continuation of life, to the nutrition and growth of each individual; and after the dissolution of the body, after it is reduced to ashes, these organical molecularæ, on which death has no power, survive, circulate in the universe, and pass into other beings, bringing with them nourishment and life. Thus every production, every renovation, every increment by generation, by nutrition, by development, supposes a preceding destruction, a conversion of substance, an accession of those organical molecularæ, which do not multiply, but ever subsisting in an equal number, render nature always equally full of life, the earth equally peopled, and equally shining in the original glory conferred on it by its creator.

Considering therefore beings in general, the total of the quantity of life is perpetually the same; and however death may appear to destroy every thing, it destroys no part of that primitive life which is common to all organized beings: death, like all other subordinate
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and subaltern powers, attacks only individuals, strikes only the surface, destroys only the form; he makes no impression on the substance, and, instead of injuring nature, causes it to shine with greater lustre by his depredations. If nature permits death to cut down individuals, and, in process of time, to destroy them, in order to shew her superiority to death and time, to exercise her ever-active power, manifest her fulness by her fecundity, and to make of the universe, by the reproduction and renewal of beings, a theatre ever crowded, a spectacle ever new: yet she never permits death to annihilate the species.

That beings may succeed each other, it is necessary that there be a destruction among them; in order to the nourishment and subsistence of animals, they destroy vegetables or other animals, and the quantity of life continuing ever the same, after as well as before the destruction, it seems to be indifferent to nature, how much such or such a species is destroyed; yet, like a provident mother, in the midst of her inexhaustible abundance, she has limited the expence, and prevented any waste, by implanting the carnivorous instinct in very few animals; and even these voracious species she has reduced to a small number of
indivi-

individuals, multiplying, at the same time, both the species and individuals of those which feed on herbage; and, in vegetables, she seems to have been profuse, both with regard to the number and fertility of the species. Perhaps man has not a little contributed to second her views, with regard to maintaining, and even establishing, this order upon earth; for in the sea that indifference, we supposed above, is conspicuous; all species there being more or less voracious, living on themselves or others. They are perpetually preying on, without ever destroying, each other; because the fecundity is equal to the depredation, and the whole consumption increases the reproduction.

Man is known to exercise his power over the creatures in a lord-like manner; those, whose flesh pleases his taste, he has selected, made them domestic slaves, multiplied them beyond what nature would herself have done, formed of them numerous herds and flocks, and, by his care to bring them into being, he seems to be entitled to the power of slaying them for his use; but this power, this right, he extends far beyond his wants: for, exclusive of those species which he has tamed, and disposes of at pleasure, he also makes war on
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the wild creatures, birds; and fishes. Instead of confining himself to those of the climate in which he lives, he travels far from home, he even visits the seas for new dainties, and all nature seems hardly sufficient to satisfy his intemperance, and the inconstant variety of his appetites. Man consumes, he alone swallows more flesh than all the beasts together devour; thus is he the greatest destroyer, and even more from wantonness than necessity. Instead of enjoying, with moderation, the good things within his power; instead of liberally distributing them, instead of repairing when he destroys, and renewing when he annihilates, the man of substance places his whole glory in consuming; he prides himself in destroying more in one day, at his table, than would afford a comfortable subsistence to several families. Thus he exercises his tyrannical power equally over animals and men; others pining with hunger and toil, only to satisfy the immoderate appetite, and the still more insatiable vanity of this man; who, while he is destroying others by want, is destroying himself by his excesses.

Yet man, like the beasts, might live on vegetables; for flesh, however analogous it may be to flesh, does not afford better nourishment than

than grain, pulse, or bread. True nourishment, that which contributes to the nutrition, the growth, and the subsistence, is not that inanimate matter which seems to constitute the texture of the flesh or the herb, but the organical *moleculæ* contained in the one or the other; as the ox, which feeds on grass, acquires as much flesh as man, or any other carnivorous animal. The only real difference between aliments is this, that an equal quantity of flesh, corn, and grain, contains many more organical *moleculæ* than grass, the leaves, roots, and other parts of vegetables, as we have ascertained from infusions made with these different substances: so that man, and those beasts whose stomachs and intestines are not of a capacity to receive a very large quantity of aliments, could not hold a sufficiency of grass to furnish the quantity of organical *moleculæ* necessary to their nutrition. And it is on this account, that man and the other animals, which have but one stomach, can only subsist on flesh or corn, which contain, in a small volume, a very large quantity of the nutritious organical *moleculæ*; but the ox, and other ruminating animals, which have several stomachs, particularly one very large, and which will consequently contain a large

volume

volume of grass, find it sufficient to furnish the necessary quantity of organical molecularæ for their nourishment, growth, and multiplication. Here the quantity compensates for the quality of the nourishment, which, in effect, is the same; it is the same substance, the same organical molecularæ, by which the ox, man, and all animals are nourished.

Here it will be objected, that the horse has only one stomach, and at the same time a small one; that the ass, the hare, and other graminivorous animals have also but one stomach, and consequently this explanation, however probable, is neither more true nor better founded. Yet these apparent exceptions, so far from overthrowing, seem rather to confirm it. For though the horse and the ass have but one stomach, yet they have cæci, or cells, of such capacious dimensions, that they may be compared to the maw of ruminating animals; and the secum in a hare is at least equal in length and diameter to a second stomach: so that it is not at all strange, that these animals derive their nourishment from herbage; and it will in general be found, that the diversity in the manner of animals feeding, depends on the whole capacity of the stomach and intestines. For the ruminating animals,

as the ox, sheep, the camel, &c. are furnished with four stomachs, and intestines of a prodigious length; accordingly they live on herbage, and herbage alone suffices them. Horses, asses, hares, rabbits, Guinea-pigs, &c. though they have but one stomach, their secum amply supplies the want of another; and these live on herbage and grain. Wild boars, hedgehogs, squirrels, &c. whose stomachs and intestines are smaller, make grain, fruits, and roots, their chief food, eating but little herbage; and those in which the stomach and intestines are of a less capacity than all others, as wolves, foxes, tigers, &c. cannot be properly nourished, but by chusing the most succulent foods, such as abound with the most organical molecularæ; as flesh, grain, and fruits.

Thus the diversity in the appetites of animals, is more owing to this necessary and physical relation, than to the taste; for were they not impelled more by necessity than taste, would they devour infected and putrid flesh, with the same greediness and avidity, as that which is fresh and juicy? Would they feed alike on all kinds of flesh? We often see dogs, which have choice of food, generally refuse some kind of meats, as woodcock, thrush, pig, &c.

&c. whereas wild dogs, wolves, foxes, &c. eat the flesh of pig, woodcock, and birds of all kinds; nay, even frogs, for I once found two in the stomach of a wolf; and in want of flesh or fish, they seem to be glad of fruits, grain, grapes, &c. and always prefer that which contains, in a small volume, a large quantity of nutritive particles, or organical moleculæ.

Should these proofs appear insufficient, let the manner in which cattle are fed for fattening be considered. The process begins with castration, thus destroying the passage through which there is the greatest waste of organical moleculæ. Then, instead of leaving the creature to his usual pasture, and letting grass be his whole nourishment, bran, corn, turneps; in a word, aliments more substantial than grass are given him: and thus the animal increases in flesh, and the abundance of fat and juices tender his flesh, which is hard and dry of itself, a succulent meat, so excellent as to be the basis of our best meals.

It also follows from these premises, that man, whose stomach and intestines are not very capacious, in proportion to the magnitude of his body, could not subsist on herbage alone. He might indeed live on bread, pulse,
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and other vegetable productions, as is proved by undeniable facts, whole nations and orders of men being known, who are forbid, by the precepts of their religion, to eat any thing that has had life. But these instances, though supported by the authority of Pythagoras, and recommended by some physicians, too fond of regimen, do not appear to me sufficiently convincing. Neither health nor multiplication of the species would have been gainers by living on pulse and bread only; for the peasants, whom the luxury of towns, and the plenty of our tables, reduce to that manner of living, languish and die sooner, than men in middling circumstances, who are equally strangers to want and excess.

Next to man, the greatest destroyers are those animals which live wholly on flesh; they are at once an enemy to nature, and a rival to man; whose close attention, premeditated and constant care, are necessary to preserve his poultry, &c. from the pounce of the bird of prey, and the teeth of the wolf, fox, polecat, weazle, &c. It is only by a continual war, that he can protect his corn, his fruits, his whole substance, and even his apparel, against the voracity of rats, caterpillars, beetles, moths, &c. for insects are also some of

these

these creatures that destroy rather than repair: whereas black cattle, sheep, and other graminivorous animals, are not only the best, most useful, and the most valuable to man, as feeding him, but likewise those which consume the least. The ox, especially in this respect, may, by way of excellence, be stiled *the animal*; for he returns full as much to the earth as he takes from it; he even meliorates the soil on which he lives, and fattens his pastures; whereas the horse, and most other animals, in a few years; exhaust the richest meadows.

But these are not the only advantages which the horned cattle procure to man; without the ox, both the rich and the poor would find it difficult to live: the earth would lie uncultivated; the fields, and even the gardens, be dry and barren. He is the principal instrument in all the works of husbandry. He is the most useful servant in a farm; the support of rural œconomy, and on him the whole burden of agriculture lies. Formerly the wealth of man chiefly consisted in his herds of black cattle, and they still continue the basis of national opulence. For it is only by the cultivation of lands, and the abundance of cattle, that a state can be supported in flourish-

rishing circumstances. These are alone the real goods; all others, gold and silver not excepted, are only arbitrary; money and credit having no other value than what they derive from the products of the earth.

The ox is not so well adapted for carrying burdens as the horse, the ass, the camel, &c. This is evident from the form of his back and reins; but his thick neck and broad shoulders shew how fit he is to draw and bear the yoke: accordingly this is the manner in which he draws to the greatest advantage; and it is something strange, that this use of the ox is not general, for in many provinces the ox still draws by his horns. The only reason I ever heard for it is, that he is more easily guided in this manner. The strength of his head indeed enables him to support his labour tolerably well in this manner; but to much less advantage than when he draws by his shoulders: he seems to have been expressly formed for the plough; the unweildly magnitude of his body, his slow paces, his short legs, every thing, even his quietness and patience in toil, concur to fit him for tillage; and enable him, above any other animal, to surmount the constant resistance of the earth against his efforts. The horse, though per-
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haps equally strong with the ox, is less proper for this use; his legs are too long, his paces too quick and too impetuous; and he soon frets and tires. Besides, by putting him to the plough, we deprive him of all the agility, and suppleness of his motions; of all the beauty of his attitude and carriage. For this heavy labour requires rather constancy than ardour; rather strength than swiftness, and weight rather than elasticity.

In the species of animals which man has assembled in flocks and herds, and where multiplication of the species is the principal intention, the female is more useful than the male: the produce of the cow is an advantage continually increasing and renewing. The flesh of the calf is at once plentiful, wholesome, and delicate; milk is the principal aliment of children; butter improves most of our dishes; and cheese is the most common food of the peasant. How many poor families are reduced to live wholly on their cow! Those very men, who every day, from morning to evening, groan under the labours of the field, and support the toils of the plough, acquire only brown bread; being obliged to give up the flour and substance of their corn to others. It is through them, though not for

them, that plentiful harvests crown the field: those very men that bring up, that multiply cattle, that tend them, and are perpetually employed about them, dare not enjoy the fruit of their labour. Reduced by their indigent condition, or rather by the cruelty of other men, they are obliged to live like horses, on barley and oats, the coarsest kinds of pulse, and four milk: the flesh of cattle is a nourishment, which they, through necessity, deny themselves.

The cow may also be rendered proper for the labours of the field, and often supplies the place of the ox, though not of an equal strength; but when employed in this service, care should be taken to match her as nearly as possible with an ox of equal strength and stature, for preserving an equal draught, and keeping the plough-share duly balanced between these two powers: the less unequal they are, the more easily and regularly the tillage is performed. Six or eight oxen are often employed in strong soils, especially in fallow grounds, which turn up in large long clods; whereas a sandy and loose soil may be tilled with only two cows. Besides, in these light soils, the furrows may be continued to a greater length, than in strong soils. Among the ancients, an
hundred

hundred and twenty paces was the greatest length of a furrow, which the ox was to make by an uninterrupted effort; after which, say they, he is not to be goaded farther, but allowed to breathe a while, before the same furrow is continued, or another begun: but, among the antients, agriculture was a favorite study: they did not disdain to put their own hands to the plough; at least, they countenanced the husbandman, and consulted both his ease and that of the ox; whereas among us, those who enjoy the most of the products of the earth, are the last to esteem, encourage, and support the art of cultivation.

The bull chiefly serves for propagating the species; and though he also may be subjected to the yoke, yet there is no being certain of his working quietly, and the use he may make of his prodigious strength is constantly to be guarded against. This creature is naturally untractable, stubborn and fierce; and in the bulling season, he is absolutely uncontrollable, and often furious; but, by castration, the source of these turbulent impulses is destroyed, and without any diminution of his strength. He also grows larger, more heavy and unweildly, and becomes adapted to the labour for which he is designed. This operation

tion also renders him more tractable, patient, docile, and less troublesome to others. A herd of bulls could not be either tamed or managed by human skill and power.

The method of performing this operation is well known to peasants; though the times of performing it are various, the different effects of which have not, perhaps, been sufficiently attended to. In general, the most proper age for castration is that immediately preceding puberty, which, in horned cattle, is eighteen months, or two years; few of those that undergo the operation sooner, long surviving it. Calves however, whose testicles are taken out soon after their birth, if they survive the operation, which is very dangerous at that early age, become more large, fleshy and fat, than those which are not castrated till the second, third or fourth year after; but the latter seem to retain more spirit and activity: and those which are not castrated till the sixth, seventh, or eighth year, lose little or nothing of their other masculine qualities, being more impetuous and indocile than other oxen; nay, in the bulling season, they are desirous of getting to the cows, which must be carefully avoided, as the copulation, and even the very touch of
such

such an ox, produces in the vulva of the cow a kind of carnosities or warts, which can only be destroyed by the actual cautery. The cause of this may be, that in those oxen whose testicles have been only compressed, and the seminal vessels twisted, still continue to emit a liquor, which being probably half purulent, cause ulcers in the vulva of the cow, which afterwards degenerate into carnosities.

Spring is the usual season when the cows are in heat. In this country most admit the bull, and become pregnant between the 15th of *April* and 15th of *July*. Some indeed are more forward, and others more backward in their heat. They go nine months, and calve at the beginning of the tenth. Thus the season for calves is from the 16th of *January* to the 16th of *April*; but there is no want of them during the whole summer, autumn being the season when they are most scarce. The tokens of the cow's heat are not at all equivocal; it is known by her frequent lowings, which are also more violent than at other times. She leaps on cows, oxen, and even bulls; and the vulva is inflated so as to project outwards. The time of this strong heat should be well observed, and the bull brought to her; for if
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this fervor is suffered to cool, the cow would not so certainly retain.

The bull, like the stallion among horses, should be chosen from the most beautiful of the species. He should be large, well made, and in good case; have a black eye, a proud look, large forehead, short head, the horns large, short, and black, the ears long and shaggy, the muzzle large, the nose short and strait; the neck thick and fleshy; the shoulders and breast broad; the reins firm; the back strait; the legs thick and fleshy; the tail long and full of hair; the walk firm and steady; and the colour red.

Cows are often known to retain at the first, second, or third time; and when pregnant, whatever appearance there may be of heat, the bull refuses to cover them. But the heat generally ceases almost immediately on their conception, and they themselves will not suffer the bull to approach them.

Cows are subject to abortion when not taken proper care of; or when used in a carriage. They even require greater care when pregnant than at other times, to prevent their leaping over hedges, ditches, &c. They should also be put into the richest pastures, and in a soil
which

which abounds in herbage, without being too moist or fenny. Six weeks or two months before they calve, they should be fed more plentifully than usual; giving them in the summer-time grass in the cow-house, and in the winter bran, lucern, sainfoin, &c. During this time they must not be milked, that fluid being then absolutely necessary to the nourishment of the fœtus: some cows indeed do not yield any milk a month or six weeks before they calve; but those which have milk till the time of calving, are both the best mothers and the best nurses; though the milk is then generally bad, and in small quantity. The same, or rather more care must be observed at the delivery of the cow, than at that of the mare, the former seeming on this occasion more spent and weakened than the latter. One indispensable point is, to put her in a separate stall, where she must be kept warm, at ease, and on good litter. She must be well fed for ten or twelve days, with beans, corn, or oatmeal, diluted with salt water, and lucern, sainfoin, or good grass, thoroughly ripe. By this time she is usually recovered, and may therefore by degrees be put to her common way of living, and turned into the pasture; observing not to take any milk from her during the two first months,

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as the calf will thrive the better ; besides the milk is not of a good quality.

A young calf is left with its dam the first five or six days, that it may be kept always warm, and suck whenever it pleases ; but if in these five or six days it grows and gathers strength, there is a necessity for making a separation, as it would exhaust the cow if left always with her. Sucking two or three times a day will now be sufficient. If you intend to fatten him speedily, and at the same time render his flesh fine and delicate, let him have every day raw eggs, boiled milk, and the crumb of bread : thus at the end of four or five weeks, the flesh will be excellent. Calves therefore intended for the butcher, should not suck above thirty or forty days ; but those designed for keeping should be left with the dam for two months at least ; as the more they suck the stronger and larger they will prove. The best for bringing up are those calved in the months of *April*, *May* and *June*. It is seldom that those which come later attain to a sufficient vigour to support them during the inclemencies of the following winter ; the cold causing them to droop, and many of them to die. Thus calves designed for keeping should be weaned at two, three, or four months ;
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but before taking them totally from the milk, a little good grafs, or chopped hay, is to be given them, that they may become accustomed to this new aliment, when they are to be entirely separated from their dam, and never suffered to come near her either in the stall or pasture, whither they are to be sent every day, and remain during summer, from morning to evening; but on the setting in of the cold of autumn, they must not be let out till late in the morning, and brought back early in the evening; and the cold of the winter being extremely detrimental to them, they are to be kept very warm in a close cow-house, and well supplied with water; sainfoin, lucern, &c. should be mixed with their common grafs. They must be let out only in warm weather. A great deal of care is necessary to bring them thro' the first winter, which is the most dangerous period of their lives; for the following summer will strengthen them so much, that they will have nothing to fear from the cold of a second winter.

The cow reaches the age of puberty at eighteen months, and the bull at two years; but though they are at that age capable of generation, it is adviseable not to suffer them to copulate under three years. The time of their
greatest

greatest strength is from three to nine years, when the best way of disposing of cows and bulls is by fattening them for the slaughter. As they acquire the greatest part of their growth in two years, the duration of life, like that of most other species of animals, is nearly seven times two years, and they rarely live above fourteen or fifteen.

In all quadruped animals the voice of the male is stronger and deeper than that of the female, and this is, I believe, a rule without exception; though some of the antients tell us, that the cow, the ox, and even the calf, have a deeper voice than the bull. Certain it is, that the bull has a far stronger voice, as being heard to a much greater distance than either the cow, ox, or calf; and what has given rise to a belief of its voice being less deep is, his manner of lowing, which is not a simple sound, but composed of two or three octaves, the highest of which most affects the ear; and if we listen to it, we shall perceive a sound more hollow than that of the ox, the cow, or the calf, whose lowings are also much shorter. It is love only that causes the bull to low; the cow oftener lows from fear than love; and when the calf lows, it is from grief, hunger, or a desire of its mother.

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The most heavy and sluggish animals are not always those which sleep the longest, nor the most soundly. The horned cattle sleep, but it is short and unsound, the least noise awakes them. They usually lie on the left side, and the kidney on that side is always larger, and has more fat about it than that on the right side.

Oxen, like other domestic animals, vary in colour, though the dun seems the most common; and the redder it is, the more it is esteemed. A black coat is also valued; and bay oxen are said to be vigorous and long lived; whereas the brown soon decay. The grey, the dappled, and the white are proper only for the slaughter; no care can render them fit for labour; but whatever be the colour of an ox's coat, it should be glossy, thick, and smooth to the touch; for if it be harsh, rough, or thin, there is reason to suppose that the animal is out of order, or, at least not of a strong constitution. A good ox for the plough must be neither too fat nor too lean; the head short and thick; the ears large and shaggy; the horns strong, glossy, and of a middling size; the forehead wide, the eyes full and black; his muzzle large and flat; the nostrils wide and open; the teeth white and even;

even; the lips black; a fleshy neck, large and heavy shoulders; the breast broad; the dew-lap hanging down to the knees; the reins very broad; a spacious descending belly; the flanks firm; the haunches large, and the rump thick; large and nervous thighs and legs; the back strait and full; the tail reaching to the ground, and well covered with thick and fine hair; the feet firm; the hide thick and pliable; the muscles raised; the hoof short and broad: he must also answer to the goad, be obedient to the voice, and well trained; but it is only gradually, and by beginning early, that the ox can be brought willingly to bear the yoke, and be easily governed. At the age of two years and a half, or three at the latest, you must begin to tame him, and bring him under subjection; if delayed longer, he becomes forward, and often ungovernable. The only method of succeeding is, by patience, mildness, and even caresses; for compulsion and ill treatment will only disgust him irreclaimably; stroaking him gently along the back, clapping him, giving him occasionally boiled barley, ground beans, and such other aliments as please him best, all of them mingled with salt, of which he is very fond, will prove of the greatest use. At the same time his horns should

should be often tied, and some days after the yoke is to be put on his neck, and fastened to a plough, with another ox of the same size ready trained; these are to be tied together at the manger, and in the same manner led to the pasture, that they may become acquainted, and accustomed to have one common motion. The goad is never to be made use of in the beginning, as that would only render him more untractable; he must also be indulged, and labour only at short intervals: for till he is thoroughly trained he tires himself very much; and for the same reason he is then to be fed more plentifully than at other times.

An ox is to draw the plough only from his third to his tenth year, when it will be advisable to fatten and sell him, as being then of a better flesh than if he was kept longer. The age of this creature is known by his teeth and horns. The first fore-teeth, which he sheds at the end of ten months, are re-placed by others; larger, but not so white; at six months the teeth next to those in the middle fall out, and are also re-placed by others; and in three years all the incisive teeth are renewed. They are then equal, long, and pretty white; but as the ox advances in years, they wear, become unequal and black. It is the same in the bull and cow; so that the growth and shedding of the teeth are not affected by

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castration, or the difference of sexes. Nor is the shedding of the horns affected by either; as both bull, ox, and cow, lose them alike at the end of three years; and these also are replaced by other horns, which, like the second teeth, remain; only those of the ox and cow are larger and longer than those of the bull. The manner of the growth of these second horns is not uniform, nor the shooting of them equal. The first year, that is the fourth year of the ox's age, two small pointed horns make their appearance, neatly formed, smooth, and towards the head terminated by a kind of button. The following year this button moves from the head, being impelled by a corneous cylinder, which also lengthening, is terminated by another button, and so on; for the horns continue growing as long as the creature lives. These buttons become annular joints, which are easily distinguished in the horn, and by which the age of the creature may be readily known; counting three years for the point of the horn to the first joint, and one year for each of the other intervals.

The horse feeds both night and day slowly, but almost incessantly; whereas the ox eats fast, and in no long interval of time takes all the nourishment it requires. It then gives over eating, and lies down to chew the cud; the difference

difference in feeding proceeding from the different conformation of the stomachs of those animals. The ox, whose two first stomachs form but one very capacious bag, may, without any inconveniency, take up a large quantity of herbage, and fill it in a small time, chewing the cud afterwards, and digesting it at leisure. The horse having but a small stomach, can put into it only a small quantity of grass, and fill it successively as the food sinks and passes into the intestines, where the decomposition of the aliments is chiefly performed; for, by inspecting these parts both in the ox and the horse, and the successive effect of digestion, especially the decomposition of the hay, we saw that in the former, on its leaving that part of the maw which forms the second stomach, is reduced to a kind of green paste, like spinage minced and boiled; that under this form it is retained in the folds of the third stomach; that the decomposition is compleated in the fourth stomach; and that what passes into the intestines is only the husks, or recrements: whereas in the horse we observed, that this decomposition is hardly visible, either in the stomach or first intestines, where it becomes only more supple and flexible, having been macerated and penetrated by the ac-

tive liquor with which it is surrounded; that it reaches the cœcum and colon without any great alteration; that in these two intestines, whose enormous capacity corresponds with the maw in ruminating animals, the decomposition of a horse's aliment is chiefly performed; and that this decomposition is never so perfect as that in the fourth stomach of the ox.

From these considerations, and the bare inspection of the parts, it seems easy to conceive, how rumination is performed, and why the horse neither ruminates nor vomits; whereas the ox, and all horned cattle, with other animals that have several stomachs, seem to digest the grass only by rumination, which is nothing more than vomiting without effort, occasioned by the re-action of the first stomach on the aliments it contains. The ox fills his two first stomachs, the second being only a part of the first; and the membrane thus extended, re-acts on the grass within it, which is but very little chewed, and the volume of it increased by fermentation. Were the aliment liquid, this contracted force would cause it to pass into the third stomach, which communicates with the other only by a narrow duct, the orifice of which is placed at the superior part of the first, and but little below the oesophagus; so that

no dry aliment can pass through this duct, at least none but the more fluid part. Thus the more dry parts necessarily ascend through the oesophagus, whose orifice is larger than that of the duct into the mouth. Here the animal chews them again, macerates, and once more impregnates them with its saliva; and thus by degrees renders the aliment more fluid, till it is reduced to a paste of a proper liquidity to pass the duct communicating with the third stomach: and here again it undergoes another maceration, before it passes into the fourth, where the decomposition of the food is completed, being reduced to a perfect mucilage. What confirms the truth of this explanation is, that while these animals suck, or are fed with milk and other fluid aliments, they do not chew the cud; and that they chew the cud much more in winter, and when fed with dry aliments, than in summer, when the grass is succulent and tender. In the horse, on the contrary, the stomach is very small, the orifice of the oesophagus very narrow, and that of the pylorus very wide, which alone would render rumination impracticable; for the aliment contained in this small stomach, though perhaps more strongly compressed than in the large stomach of the ox, cannot re-ascend, because

it may so easily descend through the capacious orifice of the pylorus. It is not even necessary for its entrance, that the hay should be reduced to a soft fluid paste, the contracted force of the stomach impelling the aliment thither, though almost dry; and it cannot re-ascend by the oesophagus, which is very small, when compared with the pylorus. It is therefore owing to this general difference in the conformation of the parts, that the ox ruminates, and the horse cannot; but there is another particular formation in the horse, which renders him not only unable to ruminate, that is, to vomit without effort, but even hinders him from vomiting at all, though he made the utmost efforts; which is, that the duct of the oesophagus entering very obliquely into the horse's stomach, the membranes of which are of a considerable thickness; and through these thick membranes the ducts or canal run so obliquely, that instead of opening by the convulsive motions of the stomach, it becomes more contracted. Though this difference, like all the other differences of conformation, observable in the body of animals, depends on nature when constant and unvaried; yet in the growth, and especially in the soft parts, there are differences apparently constant, which however may

may, and actually do, vary by circumstances: the capacity of the ox's maw, for instance, is not wholly derived from nature; the maw is not such by its primitive conformation, becoming so gradually by the large volume of the aliments received; for in a young calf, or even in one that is older, if it has only fed on milk, and never on herbage, the maw is much smaller than in the ox. The remarkable capacity of the maw therefore proceeds from the extension occasioned by the large volume of aliments taken into it at one time. But I shall now mention an experiment, which to me appears decisive. I caused two calves of the same age, and weaned at the same time, to be fed, one with bread, and the other with herbage. At the expiration of a year, on opening them, the maw of the calf which had lived on grass and herbage, was become much larger than the maw of that which had been fed with bread.

It is said that oxen which feed slowly, bear labour better than those that eat faster; that oxen of high and dry countries, are more beautiful, vigorous, and sprightly than those of low and moist countries; that dry hay strengthens them much more than soft grass; that they cannot bear a change of climate so well as horses; and that for this reason, oxen for la-

bour should always be purchased in the neighbourhood.

In winter, as oxen are put to no work, straw and a little hay will be sufficient for them; but during the time of labour, they should have a great deal more hay than straw, and even a little bran or oats before they go to work: in summer, if hay be scarce, let them have grass fresh cut from the field, or the succulent branches of ash, elm, oak, &c. but sparingly; as an excess of this aliment, of which they are very fond, sometimes causes them to make bloody urine; lucern, sainfoin, vetches, lupins, turneps, boiled barley, &c. are also excellent food for oxen. There is no need of regulating the quantity of their food, as they never eat more than they want; and it will be proper always to give them more than they eat. They should never be turned out in the pastures till about the middle of *May*; the first growth of herbs are too crude, and though they eat them greedily, they disagree with them. Also after leaving them in the pastures during the summer, they should again be taken into the house about the middle of *October*; taking care that this transition from green herbage to dry, and from dry to green, be not done at once, but by degrees.

Great

Great heat is detrimental to these creatures, and perhaps more so than violent cold. In the summer time they are to be led to their work by break of day; and during the great heat, either sent home, or left to feed under the shade of trees; but not led to work again till three or four o'clock in the afternoon. In spring, winter, and autumn, they may be at plough from eight or nine in the morning till five or six in the evening, without interruption. Though they do not require so much care as horses, yet to keep them brisk and healthy, it will be proper to curry them every day; to wash them, grease their hoofs, &c. They must also have water given them at least twice a day. The horse loves a thick and warmish water; whereas the ox must have it clear and cool.

The aliment and care for the cow and the ox are nearly the same, except only that a milch cow, both with regard to choice and management, requires some particular cautions. Black cows are said to yield the best milk; white the most; but be the coat what it will, she must be in good case, have a brisk eye, a light gait, be young, and give plenty of good milk: let her be milked twice a day in summer, but only once in winter; and if an increase of the quantity of milk be desired, it may be done by feeding

feeding her with more juicy aliments than grass.

Good milk is neither too thick nor too thin; its proper consistence is, when a small drop preserves its spherical figure without spreading; it must also be of a delicate white, that with a yellow and blue cast being of little value. The taste of it must be soft, without any bitterness or acridity; it must also have a good smell, or be without any. It is better in the month of *May*, and in summer than in winter; and to be perfectly good, the cow must be of a proper age, and in good health. The milk of heifers is too thin; that of old cows too oily, and in winter time too thick. These different qualities of milk have relation to the butyrous, caseous, and serous parts of which it consists. Milk too thin abounds too much with serous particles; that which is too thick has few or none of these particles; and the too oily has not a proper portion of butyrous and serous particles. The milk of a cow when bulling is not good; nor that when the creature is near, or just past the time of her calving. In the third and fourth stomach of a sucking calf are found clods of curdled milk, and these clods dried in the air, are the runnet made use of in curdling milk: the longer it is kept

kept the better it is, and a very little will be sufficient to turn a large quantity of milk.

Cows and oxen are very fond of wine, vinegar, salt, and will greedily devour a dressed sallad. In *Spain*, and some other countries, they place near a young calf in the cow-house, one of those stones called *salegres*, which are found in the mines of rock-salt; by licking this salt stone while his dam is at the pasture, he becomes so hungry and thirsty, that when the cow returns, the calf eagerly seizes the teat and sucks his fill; and thus he fattens and thrives much faster than those that have no salt given them. And for the same reason it is, that when oxen or cows are off their stomach, grass dipped in vinegar, or mixed with a little salt, are given them; this is also sometimes done when they are in good health, in order to sharpen their appetite, and fatten them the sooner. The general age for fattening cattle is the tenth year, as there is afterwards less certainty of succeeding; nor is the flesh so good. They may be fattened at any season, but summer is usually chosen, as it may then be done at the least expence; and if begun in the month of *May* or *June*, they are generally completely fattened before the end of *October*. When you begin to fatten them, they must be taken

taken from all work ; they must drink often, and have plenty of succulent food, sometimes mixed with a little salt. They must not be disturbed while they are chewing the cud ; and during the great heats, a cow-house, or at least some shady place, is the most proper for them to sleep in. Thus in the space of four or five months they will become so fat, as to be scarce able to walk ; so that if they are to be sent to any distant place, it must be performed by very short journies. Cows, and even bulls, whose genitals have been knit, may also be fattened ; but the flesh of cows is drier, and that of the knit-bull more red and tough, than the flesh of oxen ; and that of the bull has always a strong disagreeable taste.

Bulls, cows, or oxen, are very much given to lick themselves, especially when at rest ; and this being thought an impediment to their fattening, all the parts of their bodies within their reach are rubbed over with their dung : without this precaution, their tongues, which are very rough, abrade, or take off their hair which they swallow ; and as this cannot be digested it remains in the stomach, and forms round balls by accretion, called *ægagropiles*, which are sometimes so large, that they must be troublesome, and impede digestion. These
balls

balls are, in time, invested with a brown hardish crust, which is nothing more than an inspissated mucilage, which, by continual friction and coction in the stomach, becomes hard and glossy. These balls are found only in the maw; and if any hair insinuates itself into the other stomachs, it does not continue either there or in the intestines, probably passing off with the excrements.

Animals with incisory teeth in both jaws, as the horse and ass, nip more easily short herbage, than those whose upper jaw is without the incisory; and if the sheep and goat cut the herbage very close, it is owing to the smallness and thinness of their lips; but the thick-lipped ox can only crop the long herbage; and this is the true reason why he never injures the pastures in which he lives. As he crops only the extremity of the young herbage, he does not affect the root, and retards its growth but very little; whereas the sheep and goat, by nipping the herbage very close, both destroy the stem, and injure the root. The horse chuses the most slender herbage, while the larger, whose stems are hard, he leaves to feed and multiply: whereas the ox crops those thick stems, and by degrees destroys the coarser herbage. Hence it is, that after some years
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the herbage where a horse has lived becomes coarse; whereas that where the ox has fed becomes a fine pasture.

The species of our cattle, must not be confounded with that of the *aurochs*, the buffalo, or the bisonet; it seems to be an original native of these temperate climates, great heat and excessive cold being equally detrimental to our horned cattle. Besides, this species, so very numerous in *Europe*, is not to be found in the southern countries; nor has yet spread itself beyond *Armenia*, and *Persia* in *Asia*; and *Egypt* and *Barbary* in *Africa*. For, with regard to the bisonets, which have hunches on their backs, and found in *India*, *Africa*, and even in *America*, are, with other animals, which travellers have been pleased to call oxen, of a different species from our black cattle. Those found at the *Cape of Good Hope*, and different parts of *America*, were originally carried from *Europe* by the *Dutch* and *Spaniards*. In general, countries something colder than our own seem to agree better with black cattle than those that are hotter; and they are larger and more fleshy, in proportion as the climate is moister, and abounds in pasture. The largest black cattle known are those of *Denmark*, *Podolia*, *Ukrain*, and that part of *Tartary* inhabited

bited by the *Calmucks*. The cattle of *Ireland*, *England*, *Holland* and *Hungary* are also larger than those of *Persia*, *Turky*, *Greece*, *Italy*, *France* and *Spain*; but the smallest yet known are those of *Barbary*. The *Dutch* are known to import annually a number of large, lean cows from *Denmark*, which, improved by living in the pastures of *Holland*, yield a great deal more milk than the cows of *France*. It is this breed of milch cows which has been transported into *Poitou*, *Aunis*, and the marshes of *Charente*, where they are called *Flanders* cows; they are much larger and leaner than the ordinary cows, and yield twice the quantity of milk and butter; their calves are also much larger and stronger; and except four or five days before their calving, they may be milked during the whole year. These cows however require excellent pastures, though they eat little more than the common sort; but as they are always lean, the superabundance of the pasture turns wholly to milk; whereas the common cows, after living some time in luxuriant pastures become fat, and yield little or no milk. Between a bull of this kind and one of the common cows, is produced another breed, called *bastard*, which is at once more prolific, and abounds more in milk

milk than the common breed. These bastard cows have often two calves at a time, and also yield milk during the whole year; the milch cows make a large part of the wealth of *Holland*, which every year exports butter and cheese to a very considerable amount. These cows give twice as much milk as those of *France*, and six times as much as those of *Barbary*.

In *Ireland*, *England*, *Holland*, *Switzerland*, and the northern countries, large quantities of beef are salted and smoaked, either as a branch of commerce, or for the sea service: hides also make one of the exports of these countries. The skins of black cattle, and even those of their calves, are known to serve for an infinite number of uses. Their tallow is also very useful, and often mixed with mutton suet. The dung of black cattle is the best manure for dry and light lands. The horn of this animal was the first vessel man drank out of; the first instrument used for increasing sounds; the first transparent substance used for making windows, lanthorns; and when softened, wrought or moulded, is now used in making boxes, combs, and a thousand other particulars. But let us stop here; for where the history of arts begins, that of nature should conclude.

D E-



DESCRIPTION

OF THE

B U L L.

WE have observed so many relations between the horse and the ass, which resemble each other in so many respects, that most of the differences between them, especially their viscera, could not be discovered, but by a continued comparison between all the parts of their bodies; so that by describing the horse, we may be said, in a great measure, to have described the ass: all therefore that remained was, to enumerate these resemblances, and exhibit the proofs of the difference we observed between these two animals: but the description of the ass is not more connected with that of the horse, than the bull is different from it; the only resemblance between them being that of a quadruped.

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All animals of this class have common characters; these characters are always constant, and, in general, so evident as to be perceived without difficulty, and known without any danger of mistake. If therefore it be easy to distinguish a quadruped from a bird, a fish, or an insect, it is also very easy, on seeing quadrupeds of several kinds, to perceive that there is some difficulty in discovering the differences that determine the species. These differences influence more or less the conformation of the creature. The naturalists, in order to establish the characters of their various methods, have made use of those differences which to them appeared the most considerable; but they have not always chosen the most essential. Of all the naturalists *Aristotle* has given us the best division for quadrupeds, distinguishing them into *solipedes*, or whole footed, and *fissipedes*, or cloven footed. It appears that the difference, which regards the number of the claws, exists only in animals, between which there are still other more essential differences in their conformation and constitution, both externally and internally. Hence it is that the bull, which is a cloven footed animal, has several characters of conformation different from those of the horse, which is a solipede; while, on the contrary,

contrary, the differences between the ass and the horse, both which are solipedes, are small. But the bull is nearly the same when compared with other cloven footed animals. In describing them we shall successively enquire into the several differences that exist between them, as we did with regard to the horse and ass.

At present we are to describe the principal conformation of all cloven footed quadrupeds, beginning with the bull; and this description will, in a great measure, serve for the ram, the goat, &c. as the description of the horse served for that of the ass.

The names given to the external parts of the horse, which we explained in the description of that noble animal, are in general applicable to the parts of the bull, corresponding with those of the horse, and sufficiently resemble them to admit of a comparison, and bear the like names; so that we shall make use of those already known, without repeating the explanation. But for the better understanding of the description of the bull, it will be necessary to enumerate the parts this animal has more than the horse; and also those which differ so greatly from the same parts in a horse, as to have been called by different names; and, lastly, to revive the proper names of those,

which are not disguised by terms of art, as in the horse.

The muzzle of a bull is the lower extremity of the head, and is shorter and broader than the same part of the head in both the horse and ass.

The fore and upper part of a bull's neck is called the nape.

The dewlap is the skin hanging from the under jaw and along the throat, and extends along the breast, hanging down between the fore-legs to the knees.

In a bull the third phalanx, or joint of each toe, is covered with a horny substance, as in the hoof of a horse, and has been, tho' very improperly, called *nails*, as that term implies only the horn in the upper part of the extremities of the toes, and not that which entirely invests it. Fissipedes have either nails or claws; the camel has nails, the horn covering only the upper part of the third phalanx of its toes; but the bull, ram, goat, &c. have real hoofs; and the only difference between them and those of the solipedes, consists in there being two on each foot.

Though there is much less variety in the colours of the bull than in those of the horse

yet they are called nearly by the same names, when these names are applicable.

The most general, and consequently the most natural colour of the bull is the *fallow*; so that, had we wild bulls, there is reason to think they would be of that colour. But in our tame bulls it is often blended with black and white; and some bulls are wholly black and wholly white.

Thus there are bay bulls, red, brown, grey, spotted, &c. so that they may be said to have all the tincts of the fallow, blended with white, brown and black, in variegated spots, without any constant rule.

The bull has a feather in the middle of his forehead; and I have observed in horned cattle, that the hair covering the upper part of the neck, equally distant from the shoulders and the head, are bristled along a transverse line; the hairs growing on the posterior side of this line project forward, and those on the anterior side backward.

It has been thought that the good or bad qualities of bulls, oxen and cows, might, like those of the horse, be determined by the colour of their coats; some rules of consequence have been laid down concerning these marks, and said to be founded on the pituitous, phlegmatic,

matic, bilious, or melancholic humours supposed to prevail in the constitutions of these creatures; and shewing themselves outwardly in the colours of the coat. But in this case, observation long continued on the good or bad qualities of animals, would be preferable to all the reasons founded on the different humours; and I make no doubt but it would be soon incontestibly proved, that the colours of the coat are not surer indications of the qualities of bulls, oxen and cows, than they are in horses. The reader may consult what has been said on this head in the description of the horse. It is more probable, that a thick, glossy, smooth, and soft coat indicates a good constitution, or at least a good state of health; there being reason to believe, that the juices whence this hair has its rise, and by which it is nourished, are of a good quality, and flow from sound and well organized intrails. In general, the hair of the bull is softer and finer than that of the horse.

In the history of the ox we have particularized the marks of external conformation, in order to know the best proportioned and most vigorous bulls; the most robust and most laborious oxen; and the cows which give the best milk. It therefore only remains to enu-

merate

merate the dimensions of the different parts of the bull's body, which I have taken from that kept in the bear-garden at *Paris*. This bull is thought to weigh about seven hundred pounds, is near seven years old, is chiefly of a fallow colour, but decorated with large brown spots, especially on the neck, head and legs, and has several white spots on different parts of his body. The hair is short, except between the horns, where the tuft is about two inches long; but in other bulls it is longer. The tail, to the distance of nine inches, is covered with long hairs, hanging a foot below the dock. At the end of the sheath is also a tuft of hair an inch and a half long; and that of the coronet, is, in all the four legs, visibly longer than the hair on the rest of the body.

This bull, from the tip of the muzzle to the anus, measures seven feet and a half in a direct line; is four feet one inch and a half in height, measured from the ground under its fore-legs; and four feet three inches from the ground under his hind-feet; the length of the head, from the extremity of the lips to the horns, is one foot nine inches; the circumference of the end of the muzzle, taken above the nostrils, measures one foot nine inches; the contour of the aperture of the mouth is one foot, measured on the lips; the lower jaw is about se-

ven inches broad at the upper extremity; that is, where the channel between the two bones, that form the under-jaw, is broadest, and nearest the throat; the nostrils are much farther from each other in their upper than lower parts, the intermediate space being two inches broad at the lower part, and four inches four lines at the upper; the distance between the anterior angle of the eye, and the extremity of the lips, is eleven inches; and between the posterior angle and the ear four inches; the length of the eye from one angle to the other is one inch nine lines, and the aperture about fifteen lines; that is, the two eye-lids separate to that distance; when the eye is open, we see, near the anterior angle, an oblique furrow an inch and a half in length, extending over a pretty deep hollow; there is another hollow on the forehead ten lines in depth; the anterior angles of the eyes are eleven inches distant from each other, following the curve of the forehead, though only eight inches, suppose the distance be measured in a direct line; the head, measured just below the ears and the horns, is three feet and a half in circumference; the length of the ears, measured along their posterior parts, is eight inches, and the external circumference at the base, of the same dimensions; each of the ears is placed below the horns, extending
side-

side-ways in a horizontal direction, and the distance to the horn one inch; between the bases of the two horns is a space of eight inches; the length of each horn is eleven inches measured along their curve; their circumference at the base is nine inches, and their extremities eighteen inches from each other; the head rises at the nape an inch and a half above the neck; the neck, from the head to the shoulders, is three feet in length; the circumference near the head three feet and a half, and a foot and a half in depth at the same place; six feet one inch in circumference near the shoulders, and two feet and half deep, including the dewlap, which falls four inches below the sternum, and reaches to the knee.

The chest, measured behind the fore-legs, is six feet three inches in circumference; six feet eight inches in the middle, which is its greatest bigness; and six feet before the hind-legs, passing above the scrotum, and along the haunches. The lower part of the belly is one foot eight inches from the ground; the back is somewhat concave, and the deepest part two feet distant from an imaginary right line, passing from the upper part of the rump to the withers. The dock of the tail is three feet
five

five inches long, and eight inches and a half in circumference at its origin.

The length of that part of the fore-leg called the arm, extending from the elbow to the knee, is one foot three inches and a half; and the circumference at the thickest part, one foot four inches, and at the knee thirteen inches; the shank is seven inches in length, and seven inches in circumference at the smallest part; that of the pastern joint is ten inches and a half; the pastern is two inches in length, and nine and a half in circumference; the circumference of the coronet is one foot; and the distance from the lower part of the foot to the lower part of the knee also one foot; the distance between the elbow and the withers is one foot nine inches and a half; and from the elbow to the lower part of the foot two feet four inches; the space between the fore-arms is filled with the dew-lap.

The thigh, from the ham to the stifle-bone, is one foot four inches and a half, and the circumference at the upper part two feet four inches; the breadth of the thigh near the hock is six inches, and the circumference one foot and a half; the length of the shank from the hock to the fetlock, is one foot two inches,
and

and the circumference at the smallest part, seven inches and a half; the dimensions of the pastern, shank, and every other part of the hind-legs, are nearly the same as in the fore-legs; the length of the hoof, from the toe to the heel, is seven inches; the two hoofs, taken together, are five inches broad from one side to the other; but there is an interval of an inch between them; the thickness of them before is four inches and a half; the circumference of the two hoofs joined is equal to that of the coronet.

The bull has scarce any expression in his physiognomy; when viewed in front, he offers only a vast concave forehead, a wide and thick muzzle, and eyes covered by large protuberances; he has no decisive feature; and consequently instead of any instinctive ingenuity, we see only a mass nearly informous, which can be only declarative of stupidity. The head of the bull receives a farther disadvantage from the low position of the ears, and their horizontal direction; but the forehead is graced with two horns, whose curvature is symmetrical and regular. Each horn, at its basis on the head, extends side-ways, then forms a curve downwards, and rises till its extremity terminates in a point a little backwards. The
interval

interval between the two horns is proportioned to the breadth of the forehead; and though with regard to the length of the head, the horns seem short, yet they thence appear the more firm and secure; the end of the muzzle is also a little enlivened by the lineaments of the mouth and nostrils. The head, seen in profile, does not appear so clumsy as in front. His large and full eye adorns the middle of it, and, in some measure, conceals the great distance between the horns and the extremity of the muzzle; but when the eyes sparkle, and especially when the head is moved, all the features seem to approach towards each other, so that the roughest parts of the face appear contracted: thus in the bull, the expression of ferocity succeeds that of stupidity; but whatever attitude he throws himself into, his carriage is always sluggish and aukward. This animal, when at rest, seems weighed down by the largeness of the fore-parts of his body; he carries his head low; and his neck is so thick, as scarcely to be distinguished from his shoulders. The dew-lap falls down to his knee like a clog, and admits a distinct view only of the lower part of the fore-legs, which seem overloaded with the weight they bear; the hinder part of the body, though not so large

large as the fore, is not more elegant; the haunches are too flat, too wide, and on all sides ending in large protuberances, without any rounding in the rump; and if the creature be any thing lean, the bones appear as if ready to make their way through the skin; so that when the creature is in motion, he appears like a walking skeleton. A bull, however, like that above described, ought to be considered as a noble animal; the faults we find in him, flow only from comparing him with other animals, and perhaps with our own body; but the naturalist considers him in another light; he compares the large body of the bull with those of the elephant and rhinoceros, which nature denies to these climates; he admires in these prodigious living masses, the omnipotence of the creator, who has endued them with motion, and is struck with admiration at that supreme intelligence, which in different animals has formed different organs, and endued them with an instinct suitable to their nature.



THE
NATURAL HISTORY
OF THE
S H E E P.

 T can hardly be doubted but that those animals, which at present are tame and domestic, were formerly wild. We have seen proofs of this in those whose histories we have already given; and we know that there are at present wild horses, asses, and bulls. But man, who has subjected to himself so many millions of individuals, can he boast of having totally conquered one single species? As all were created without his participation, is it not reasonable to think that they had all orders to increase and multiply without his assistance? Yet the weakness and stupidity of the sheep being considered, and likewise that this defenceless animal cannot save itself by flight; that all carnivorous animals

animals are his enemies, singling it out in preference to others, and devouring it for the fineness of its flesh: at the same time we must remember that this species is not very prolific, and that each individual is but short lived: when these particulars are considered, we should be inclined to think, that from the beginning of things, the sheep has been committed to the care of man; that his protection is necessary to its subsistence, and his care to its multiplying; nor are any deserts known to afford wild sheep; but in all places where man does not govern, the lion, the tyger, and the wolf reign by violence and cruelty; these voracious animals live longer, and multiply much faster than the sheep: and were we even now to forsake the numerous flocks fed in the pastures, and on the hills, they would soon be destroyed before our eyes, and the whole species extirpated by the number and voracious appetites of carnivorous animals.

Thus it appears that this species is indebted to our assistance and care for its continuance; for it could not subsist of itself. The sheep is absolutely without defence or resource; the weapons of the ram are but weak; his courage nothing more than a petulance, troublesome to others, useless to himself, and destroyed by castration.

castration. The weathers are still more timorous than the ewes. It is from fear that they so often assemble in flocks; the least uncommon noise causes them to leap over each other, or gather close together; while this fear is attended with the grossest stupidity: they have not sense to avoid danger; they even appear not to feel their disagreeable situation; they stray wherever they happen to be, whether it rain or snow; and such is their obstinacy, that in order to make them change their place, or follow any road, they must have a leader, trained to walk before them, whose motions they readily follow step by step. This leader himself would stir no more than the rest of the flock, were he not driven by the shepherd, or hunted by the guardian dog, which is taught to protect and defend them; to guide, separate, gather them together, and direct them in their motions.

Sheep, therefore, of all quadruped animals are the most stupid, and have the least instinct and contrivance. The goats, which in so many respects resemble them, have much more sagacity: they stand in need of no guide, they shun dangers; new objects soon become familiar to them; whereas the stupid sheep neither shuns nor approaches: though under the greatest
want

want of assistance, they do not approach man so freely as the goat; and what in animals seems the lowest degree either of fear or insensibility, they see their lambs taken away without anger, without resistance, and without expressing their grief by any cry different from their common bleating.

But this animal, in itself so despicable, so destitute of sentiment and internal qualities, is to man the most valuable; its utility the most immediate and extensive: it alone satisfies wants of the greatest necessity; it furnishes both food and apparel, besides the advantages arising from the suet, milk, skin, intrails, bones, and dung of this creature, to which nature seems to have given nothing as its property; all is to be delivered up to man.

Love, the most general and active sentiment, is alone able to impart some vivacity to the ram; he becomes wanton, fights, rushes against the other rams, and sometimes even attacks his shepherd; but the ewe, when in heat, seems not at all the more affected, or the more animated; her instinct reaches no farther than not to refuse the ram's approaches; to chuse her food, and know her lamb. The instinct of this animal is the surer, as it is more mechanical; and, if I may be allowed the expression,

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pression,

pression, the more innate. A young lamb will, amidst a numerous flock, find its dam and seize the dug, without ever being mistaken. Sheep are also said to be impressed by modulated sounds, to feed more assiduously, to be in better health, and to fatten sooner by the sound of a pipe; and that they are evidently sensible of the charms of music. But it is also said, and I believe with more truth, that music rather serves to amuse the shepherds tedious hours, and that to this supine and solitary life the origin of that art is owing.

These animals, whose instinct is so simple, are also of a very weak constitution; they cannot bear walking any length of time; travelling exhausts them; running soon puts them out of breath; the scorching rays of the sun hurt them equally with the rain and snow. Their diseases are many, and most of them contagious. The superabundance of their fat often proves fatal to them, and always hinders their fruitfulness; they yean with difficulty; they frequently cast their lambs, and require more care than any other domestic animal.

When a ewe is near yeaining, she must be separated from the flock, and watched, in order to be assisted; the lamb often presents itself a-thwart, or with its feet first; and in
this

this case, without assistance, the ewe's life would be in danger. After yeaning, the lamb is raised on his feet; at the same time all the milk in the ewe's udder is milked out, it being vitiated, and very noxious to the lamb, which is kept from sucking till the udder is filled with fresh milk: the lamb is kept warm, and for three or four days shut up with the ewe, that it may learn to know her, during which time the ewe is fed with good hay, barley meal, or bran mixed with a little salt; and water, whose chill is taken off, and mixed with a little quantity of flour, bean-meal, or ground millet, given her to drink. At the end of four or five days she may be gradually fed like the rest, and sent with the flock, taking care that she be not driven too far, lest her milk be heated. Some time after, when the sucking lamb shall have gathered strength, and begins to play, no farther care is requisite; it may be left to follow its dam to the pastures.

All the lambs of a weakly appearance are generally disposed of to the butcher; those intended to be kept being the largest, most vigorous, and having the thickest fleece. Lambs of the first yeaning are never so good as the following. To bring up lambs yeaned in the months of *October, November, December, Ja-*

January and *February*, they must be kept in the house during the winter, going out only in the morning and evening to suck; but in the beginning of *April* they may be turned into the open fields. Some time before this a little grass is daily given them, in order to habituate them by degrees to this new food. They may be weaned at the end of one month; but it is better to delay it for six weeks or two months. White lambs, without spots, are always preferred to the black or mottled; white wool being more valuable than the black or mixed.

The proper age for castration is at the end of five or six months, or even a little later in spring or autumn, when the weather is mild. This operation is performed by two different methods; the most common is by incision, when the testicles, which are easily separated, are drawn out through the wound: the other is performed without incision, by tying a string very tight round the scrotum above the testicles; for this compression destroys the vessels which supplies them with blood and juices. The lamb, on castration, becomes sickish and dull, so that it would not be improper to give him, for two or three days, a little bran mixed with a small quantity of salt, to prevent a loss of appetite; which this operation often causes.

At

At the end of a year, rams, sheep, and weathers lose the two fore-teeth of the lower jaw; and they are known to want the incisive teeth in the upper jaw. At eighteen months the two teeth joining to the former, also fall out; and at three years, being all re-placed, they are even and pretty white. But as the creature advances in age they become loose, blunt, and afterwards black. The age of the ram is also known by his horns, which shew themselves in the very first year, and often at the birth, and continue to grow a ring annually to the very period of life. Though sheep are often without horns, yet they have bony prominences in the same places of the head, where the horns of rams appear. Some sheep however have two, and others four horns, five or six inches in length, but less twisted than those of the ram; when there are four, the two outward are shorter than the others.

The ram is capable of generating at eighteen months, and a ewe may yeave at the end of a year; but it is better to delay it till the ewe be two, and the ram three years old. The produce of these animals, if too early, and even the first, is always weak, and of a bad constitution. One ram will be sufficient for twenty-five or thirty ewes; but he should be

remarkable for strength and comeliness. He must also have horns; for some have none, and such, in these climates, are very indifferent. In a good and comely ram, the head must be large and thick, the forehead broad, the eyes large and black, the nose short, the neck thick, the body long and raised, the back and rump broad, the testicles large, and the tail long. The best are white, with a large quantity of wool on the belly, tail, head and ears, down to the eyes. The best sheep for propagation are those which have most wool, and that close, long, silky, and white; especially if at the same time they have a large body, a thick neck, and a light method of walking. And it has been already observed, that those which were rather lean than fat, bring forth more easily than others.

The season of the ewe's heat is from the beginning of *November* to the end of *April*; but they may be brought to conceive in any season, by giving them provocative foods, as salt water, and bread of hemp-feed. Each ewe is covered three or four times, and then separated from the ram, which always prefers the older sheep, and neglects the younger. In the season of copulation they should not be exposed to the rain or bad weather, wet hinder-
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ing their retention; and a clap of thunder often produces abortion. A day or two after being covered, they are put again to their common diet, without having any more salt water; the continual use of which, as well as that of hemp-seed bread, and other hot aliments, would infallibly cause abortion. They go five months, and year at the beginning of the sixth; they seldom bring two lambs. In hot climates they year twice a year; but in *France*, and the colder countries only once. Some have the ram given to them about the end of *July* or the beginning of *August*, in order to have lambs in the month of *January*; but the ram is given to a much greater number in the months of *September*, *October*, and *November*; and lambs are in great plenty in *February*, *March*, and *April*. They are also to be had in the months of *May*, *June*, *July*, *August*, and *September*, there being no scarcity of them but in *October*, *November* and *December*. The ewe yields, during seven or eight months, plenty of milk, which is a good food for children and peasants. It also makes good cheese, especially if mixed with that of cows. The time for milking ewes is immediately on their going out to pasture, or on their return; twice a day in summer, and once in winter.

Ewes fatten very fast during their pregnancy, as they then eat more than at other times. As they often hurt themselves, and frequently miscarry, so they sometimes become barren; and it is not very extraordinary for them to bring forth monstrous productions. However, when properly tended, they are capable of yearning during their whole life; that is, to the age of ten or twelve years; but generally, when they are turned of seven or eight, they break, and become sickly. A ram lives to twelve or fourteen years; but after eight is no longer fit for propagation: he should then be knit, and fattened with the old sheep. The flesh of the ram, though knit and fattened, is but of a bad taste; that of the old ewe flabby and insipid; whereas that of the weather is the most succulent, and the best of all common meats.

To form a flock, from which a reasonable profit may be expected, sheep and weathers must be purchased, of about eighteen months, or two years old; and one shepherd, if careful, and assisted by a good dog, may take care of a hundred. In leading them out to pasture he should go before them, and accustom them to know his voice, to follow him without stopping, or straying among the corn, woods, and fallow lands, where they would
do

do damage. The places that best agree with them are downs, and small eminences; low, wet, and marshy grounds should be avoided.

During the winter, they are fed at home with bran, turnips, hay, straw, lucern, sainfoin, the leaves of elm, ash, &c. They are, however, led out every day, unless the weather be very bad; though this is rather to walk than feed them; and in this inclement season, it is always near ten in the morning before they are led out; and after staying four or five hours, they are watered, and brought back about three in the afternoon; whereas in spring and autumn, they are led to the field as soon as the sun has dispersed the frost or humidity on the grass, and continue there till sun-set. It is also sufficient for them in these seasons, to drink once a day, just before they are brought back to the sheep-house, where they must always find fodder, though in less quantity than in winter. It is only in summer that they are to live entirely on the pastures, whither they are led twice a day, and also made to drink twice. They are led out very early in the morning to feed as soon as the dew is down, where they continue four or five hours, after which, and being had to the water, they are brought back to the fold, sheep-house, or some other

other shady place: about three or four o'clock, when the extreme heat begins to abate, they are a second time led to the pasture, where they continue till the evening; and were it not for the fear of wolves, they should pass the night in the open air, as they do in *England*, which would render them more vigorous, clean, and healthy. As too great a heat is remarkably troublesome, and the violence of the sun beams disorders their heads, and throws them into vertigo's, it is proper to make choice of places shaded from the sun, and in the morning to lead them on eminences exposed to the east, and in the afternoon on those that are exposed to the west, that when they are feeding their heads may be in the shadow of their body. Lastly, in order to save their wool, they must not be led through any bushy places.

In dry and high grounds, especially if the herbage abound in wild thyme, and other odoriferous plants, the mutton is of a much finer quality than that which is fed in moist valleys and low plains; unless these plains be sandy and near the sea, the herbage then being sprinkled with salt; and the sheep are no-where so good as on these salt plains. The ewes also fed in them, yield more milk, and of a better taste. These animals are remarkably fond
of

of salt, and nothing is more healthful when given in moderation ; and in some places it is customary to put into the sheep-house a bag of salt, or a saline stone, which they all greedily lick one after another.

Every year the flock should be examined, in order to find out such as begin to grow old, and are intended for fattening ; for as they require a different management from the others, so they should also be formed into a separate flock. They should be led abroad in summer before sun-rising, in order to feed on the grass while moistened with the dew. Nothing forwards the fattening of weathers more than a great quantity of moisture ; and nothing more obstructs it than the heat of the sun ; so that about eight or nine in the morning, before the great heat begins, they should be brought back, and salt given them to excite thirst. About four in the afternoon they should be led a second time into cool and moist places ; and after two or three months of these little cares, they will have all the appearance of being full of flesh : indeed they are generally fattened as much as they can be ; but this fat proceeding only from the great quantity of water they have drank, may be said to be no more than an œdema, or bloated humor, which

which would in a short time turn to the rot, and can be prevented only by killing them while in this state of fatness. Even their flesh, far from being firm and juicy, is extremely insipid and flabby: in order therefore to make good flesh, besides letting them feed on the dew, and giving them a great deal of water, they should have, at the same time, more succulent food than grass. They may be fattened in every season, by only keeping them a-part in a sheep-house, and feeding them with the meal of barley, oats, wheat, beans, &c. mixed with salt, for making them drink more copiously. But in whatever manner, and in whatever season they are fattened, they must be immediately disposed of; for they cannot be fattened twice, and they will die by diseases of the liver.

Worms are often found in the livers of animals; and a description of those found in the liver of sheep and oxen, may be seen in the journal *de Scavans*, for the year 1668, and *Ephemerides of Germany*, tom. v. 1675, 1676. These worms were thought to be peculiar to ruminant animals; but M. *Daubenton* has found the very same in the liver of the ass; and it is probable the like may be found in the liver of other animals; but it is also affirmed,
that

that moths have been found in the liver of sheep. M. Rouille, secretary of state for foreign affairs, was so kind as to communicate to me a letter to him, from a doctor of physic at *Montiers*, in the duchy of *Taranteisie* in *Savoy*, from whence I have made the following extract. “ It has for a long time been observed, that the sheep of our *Alps*, which are the best in all *Europe*, sometimes fall away surprizingly. Their eyes become white, sunk, and blared; their blood serous, with scarce any redness to be seen in it; their tongue dry and shrivelled; their nose stuffed with a yellow, viscid and putrid mucus; an extreme debility, though they eat a great deal; and, in fine, the whole animal system visibly decaying. After several close enquiries, these animals were found to have in their liver white papilios, with proper wings; their heads of a semi-oval form, bilious, and of the bigness of those belonging to the silkworm. I have been convinced of the reality of this fact, by squeezing above seventy out of the two lobes; and, at the same time, all the convex part of the liver became lacerated. They have been found in the veins only, without a single instance of their being in the arteries. In the cystic duct small ones
“ have

“ have been found, together with small mag-
 “ gots. The vena porta, and the capsula of
 “ Douglafs, which a revifible there as in man,
 “ yielded to the foftest touch. The lungs
 “ and other vifcera were found.” It were to
 be wished that the doctor had given us a more
 circumftantial description of thefe papilios;
 that thefe animals which he faw may not be
 fufpected to be no other than the common
 worms found in the liver of a fheep, which
 are very flat and broad, and of fo fingular a
 figure, that they would rather be taken for
 leaves than worms.

Every year the whole flock, weathers, ewes
 and lambs, are fheared. In hot countries, where
 the creature may without danger be laid bare,
 the wool is not fheared, but plucked off; and
 often they yield two fleeces in a year. In
France, and the colder climates, it is cut only
 once a year with large fhears, ftill leaving the
 fheep part of their fleece, as fome defence againft
 the feverity of the climate. The feafon for
 this operation is in the month of *May*, after
 thoroughly washing them, that the wool may
 be as clean as poffible. In the month of *April*
 it is too cold, and if delayed till *June* or *July*,
 the wool would not grow fufficiently during
 the remainder of the fummer, to fecure them
 from

from the winter's cold. The weathers have generally more wool than the ewes, and it is also better. That of the neck, and the top of the back is the prime; that of the thighs, tail, belly, throat, &c. is not so good; and the worst is that taken from dead beasts, or such as are sick. White wool is also preferred to the grey, brown, and black, as it may be dyed of any colour. Strait wool is better than curled; and it is even said that the weathers whose wool is too much curled, are not in so good a state of health as the others. A considerable advantage may also be drawn from sheep by folding them; that is, by leaving them for a proper time on lands intended for improvement. In order to this, the ground must be inclosed, and the flock shut up in it every night during the summer. By this means the dung, urine, and heat of the body of these creatures, will in a short time bring the ground into heart, whether exhausted, or naturally cold and barren. A hundred sheep will in one summer meliorate eight acres of ground, which will continue its fertility six years.

We are told by the ancients, that all ruminant animals have suet, though this is strictly true only of the goat and sheep; and that of the sheep is in greater quantity, whiter, drier, firmer,

firmer, and of a better quality than any other. Fat differs from fuet, as continuing always soft; whereas fuet hardens as it grows cold. It is chiefly about the kidneys that the fuet is found; and the left has always more of it than the right. There is also a great deal of it in the caul, and about the intestines; but this fuet is far less firm and good than that of the kidneys, the tail, and other parts of the body. Weathers have no other fat than fuet; and so predominant is this fat in their constitution, that all the extremities of their flesh are covered with it. Their very blood is not without it; and the seminal lymph is so saturated with it, as to appear of a different consistence from that of other animals. The lymph of the human species, that of the dog, the horse, the ass, and probably of all animals without fuet, liquifies by cold, rarifies in the air, and becomes the more fluid from the time it was ejected from the animal's body. On the contrary, the seminal liquor of the ram, as well as that of the goat, and probably other animals that have fuet, instead of rarifying in the air, hardens like fuet, and, with its heat, loses all its liquidity. This difference I have perceived by microscopical observations on these seminal lymphs. That of the ram coagulates

gulates in a few seconds after its leaving the body, and to perceive the living organical molculæ, of which it contains a prodigious quantity, the object plate must be heated, in order to preserve it in a state of fluidity.

The taste of the flesh, the fineness of the wool, the quantity of the suet, and even the size of these animals, differs very greatly in different countries. In *France* they chiefly abound in the duchy of *Berry*; those in the neighbourhood of *Beauvais*, and some other parts of *Normandy* are the largest, and the fullest of suet. In *Burgundy* they are very good; but the best are those that feed on the sandy coasts of our maritime provinces. The wools of *Italy*, *Spain* and *England*, are finer than those of *France*. In *Poitou*, *Provence*, the neighbourhood of *Bayonne*, and some other parts of *France*, there are sheep which seem to be of a foreign breed; they are stronger, larger, and have a great deal more wool than those of the common breed. These sheep are also more prolific than the other, it being nothing extraordinary with them to have two lambs at a time, and yean twice a year. The rams of this breed, engendering with the common ewes, produce an intermediate breed, partaking of the two from whom it proceeds. In

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Italy

Italy and *Spain*, the number and variety in the breeds of sheep is still greater; but all must be considered as forming one and the same species with our sheep; though this so numerous and diversified species hardly extends beyond *Europe*. Those long and broad tailed creatures so common in *Africa* and *Asia*, and by travellers called *Barbary* sheep, seem to be of a species different from ours, as well as the *American Vigonia* and *Llama*.

White wool being much more esteemed than black, spotted or black lambs are almost every where sold to the butcher; though in some places the far greater part of the sheep are black; and for black lambs to be produced by a white ram and ewe, is a phænomenon common in every country. In *France* there are only white, brown, black, and spotted sheep; *Spain* has dun sheep; in *Scotland* there are yellow; but all these differences and varieties in the colour are no more fortuitous than the differences and varieties of the breeds, which are, however, wholly owing to the effects of the food, and the difference of the climate.



D E S C R I P T I O N

O F T H E

R A M.

FROM an external view of the ram and bull, there appears but little resemblance between those two animals; but on inspecting their internal parts, the very small differences found there astonish the observer; and it evidently appears, that their conformation is very nearly alike. For on comparing the viscera of the ram with those of the bull, the one is found to differ no more from the other in this respect, magnitude excepted, than the ass from the horse. The skeleton of the ram, however, considered relatively to that of the bull, is not only smaller, but also differently proportioned. Consequently these animals resemble each other so little externally, that had the ram a coat of hair like the bull, instead of his bushy fleece, he would

still be very far from resembling the bull with regard to the figure of his body. His head would still be small, his muzzle narrow, his neck short, his horns and face long, &c. in comparison of those parts respectively in the bull.

The general resemblance between the ass and the horse, causes the differences between the ram and the bull to appear the more considerable; from a supposition that being both animals of the cloven-footed kind, there should subsist between them a resemblance equal to that between the horse and the ass, both species of the whole footed genus. Why then should the horse, the ass, and the zebra, having but one hoof to each foot, differ less from each other than the cloven-footed animals? Has the creator contracted the limits of nature in whole-footed animals; while between bulls, rams, goats, stags, deer, roe-bucks, and a variety of other species of cloven-footed animals, his Almighty hand has produced so great a diversity? In order to answer this question, let us recur to the principles to which such a conceit owed its origin, and we shall see that they are very ill founded; for to those who consider nature without prejudice, she appears equally prolific in all her productions.

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With regard to animals, what are those genera, those classes, &c. established on the number of their toes? According to this methodical division, nature is limited to a small number of whole-footed species: somewhat more latitude is allowed her in that of the cloven-footed animals; and she is, as it were, unlimited in that species called *fissipedes*. This contrast of fecundity in one class, and sterility in another, were it really so, would be a contradiction in nature; but it is merely an error of judgment: this distribution of animals being purely arbitrary, and absolutely unsupported by the laws of nature.

The number of the classes of animals is supposed to depend upon the number of their toes; and in consequence of such a supposition, animals are divided into three classes; of which the first, which is that of *solipedes*, or whole-footed, contains only three species. In the class of cloven-footed animals, there are five or six times as many; and in that of the *fissipedes* is four or five times more numerous than both the others taken together. The greatest differences between the species must necessarily be found in those classes containing the greatest number, each specific mark introducing an additional difference. For this reason it is, that

the species of cloven-footed animals differ more from each other than those of the whole-footed; and between the species of the *fissipedes*, the differences are still more strongly marked and considerable. But by distributing the animals into a greater number of classes, the species in each class would have nearly an equal degree of resemblance. Among the cloven-footed animals would be found the ram, and the he-goat, the stag, buck, and the roe-buck. And among the *fissipedes*, the dog, the wolf, and the fox; the pole-cat, the ferret, the weazel, &c. between which there are nearly as many relations, as between the horse and the ass. Let our conclusion then be, that the methodical distributions can give us only very imperfect ideas of the productions of nature, and would often mislead us, by making a distinction between what is real, and what is only imaginary in these methods.

Resemblances and differences are found in all animals relatively to one another. There is an universal resemblance in their nature, and the essential conformity of the principal parts, differing only in the temperature, form, colour, dimensions, &c. The intention of the naturalist should be to ascertain these differences, and trace them through the various species; in
order

order to acquire a more perfect knowledge of each individual in particular, with the relation subsisting between animals, either with regard to the individual qualities, or specific characters. The principal differences are found in the figure and conformation; in the absolute want, and even natural privation of some parts of the body. Where the same parts are found in different species of animals, however they may differ in form and organization, as the cœcum of the horse and that of the bull, the traces of these changes may be followed from one species to another, through small gradations. But when one species has one or several parts more or less than the other, as the two horns, the three stomachs, and a toe at each foot in the bull more than in the horse; and that the former have not the tusks which are found in the two jaws of the latter, nor the incisory teeth in the upper; and at the same time has two incisory teeth more in its under jaw; these remarkable differences class the objects in the picture of nature without confusion. The parts which some animals have more than others, are conspicuous lineaments; those which are wanting in others are deep shades; and the latter no less

than the former, concur in expressing the distinguishing characters of each production.

Such characters are the most important objects in descriptions; these must be particularly enumerated; the account of them cannot be too full, or too circumstantial, as it specifies the particular methods which nature makes use of in the general mechanism of the animal œconomy. It is on this account that I have described the horse and the bull in the fullest manner.

The general colours of rams, weathers and ewes, is a dirty white, or pale yellow; there are also many of a blackish brown, and not a few spotted with a yellowish white and black. All these animals are covered with wool, a kind of coat very different from that of the horse, ass, or even ox. Wool consists of strong, slender, and very flexible filaments, soft and mellow to the touch, and frizzled in such a manner, that a tuft of curling wool, only fifteen lines in length, may be extended to three inches three lines, and often farther. This wool is found on the back and sides of the neck; that on the rest of the neck, sides of the body, belly, and shoulders, is less curled and longer; but the wool on the outward part of the thighs and tail is more coarse and harsh,
and

and almost strait. In all the rams I have examined, its length is not less than five inches. In short, the head, the inward parts of the fore and hind-legs, and the lower parts of their outsides, is covered only with a stiff and short wool, resembling hair, and not above nine lines in length.

The physiognomy of these animals is determined at first sight, so that a very few words will be sufficient to express it. Large eyes standing at a great distance from each other; the horns bending downwards; the ears placed in a horizontal position on each side of the head; a long and slender nose; and the forehead arched, are features which very well correspond with the tameness and imbecility of this animal. The horns are of a yellowish colour, shooting a little upwards from their root, then winding backwards and side-ways, extending downwards and forwards, and, near the point, turning upwards, with a small inclination side-ways. I have seen some ewes horns which were nearly in the same form with those of the ram. Though the horns of these animals stand in the most disadvantageous position for defence, and the most contemptible for their physiognomy, yet the ewes that have no horns, weathers and lambs, have a greater appearance

appearance of weakness and stupidity than rams and such ewes as have horns. In general, neither the gait nor attitude of animals of this species shew either ability, strength, or courage. Their body offers to the eye only a shapeless mass, resting on four stiff, meagre legs. The fore-legs are strait like sticks, and the hind have a uniform curve, concave before. The tail hangs down to the hock, and is as it were glued to the body, having hardly any motion, and a tuft of wool at its extremity. When a quarrel happens between two rams, and they decide it by a battle, but their first motion expresses fear and pusillanimity, rather than courage and ardour, lowering their heads, and standing some time motionless before each other; till at length they move forward, and butt each other with the front and bases of their horns; the point being so placed that they cannot make use of it: all their skill, both offensive and defensive, consists in warding off the pushes of their antagonists with the forehead, and to push with the same part. And however obstinate the action be, no fire is seen in the eye, and very little motion in either the mouth or the ears.

The size of rams varies much more in proportion than that of bulls. The ram I measured

fured was of a middle size, and the dimensions of the external parts as follow.

	Feet	Inch.	Lines.
Length of the whole body from the tip of the toe to the anus	3	1	0
Height of the fore-part	1	9	0
Height of the hinder-part	1	10	0
Length of the head, from the tip of the nose to the root of the horns	0	6	0
Circumference of the nose above the nostrils	0	7	0
Contour of the mouth	0	4	0
Distance between the angles of the lower jaw	0	2	6
Mean distance between the nostrils	0	0	8
Length of the eye from one angle to the other	0	0	9
Distance between the two eye-lids when open	0	0	7
Distance between the anterior angle and the extremity of the lips	0	4	6
Distance between the posterior angle and the ear	0	1	8
Distance in a right line between the two anterior angles of the eyes	0	3	0
Distance according to the curvature of the forehead	0	3	9
Circumference of the head taken below the horns	1	2	0
	Length		

	Feet	Inch.	Lines.
Length of the ears	0	3	0
Distance between the ears and the horns	0	0	5
Width of the base according to its outward curve	0	2	6
Distance between the two ears at the lower part	0	3	2
Length of the neck	0	9	0
Its circumference near the head	1	4	0
Ditto near the shoulders	1	10	0
Height	0	7	0
Circumference of the body behind the fore-legs	2	4	0
Circumference of the thickest part	2	9	0
Circumference before the hind-legs	2	7	0
Length of the dock of the tail	1	1	0
Circumference at its root	0	4	6
Length of the fore-leg from the cubit to the knee	0	6	6
Circumference at the thickest part	0	8	0
Circumference of the knee	0	4	0
Length of the flank	0	5	0
Circumference of the most slender part	0	2	4
Circumference of the pastern-joint	0	3	9
Length of the pastern	0	1	6
Circumference of the pastern	0	3	6
Circumference of the coronet	0	4	6
	Height		

Height from the sole of the foot to the knee	0	7	0
Distance from the cubit to the withers	0	6	6
Distance from the shoulder to the lower part of the foot	1	1	6
Length of the thigh from the stifle to the hock	0	8	0
Circumference near the belly	0	8	0
Length of the shank from the hock to the pastern-joint	0	6	9
Circumference	0	3	0
Height of the hoofs	0	1	1
Length from the toe to the heel of the fore-feet	0	1	9
Ditto of the hind-feet	0	1	7
Breadth of two hoofs taken together	0	1	5
Breadth of the hind ditto	0	1	3
Distance between the two hoofs	0	0	2½
Circumference of the two hoofs belonging to the fore-feet joined	0	5	9
Circumference of the hind ditto	0	5	0

The rams and all the animals of that species, appeared to me so nearly resembling the ox, in the situation and figure of four stomachs, intestines, &c. that there is no need to repeat the description.



THE
NATURAL HISTORY
OF THE
G O A T.

THOUGH the species of animals are all separated by an interval which nature cannot pass over, yet some seem to approximate towards each other by so many affinities, that there remains, as it were, only the necessary space for drawing the line of separation between them; and when we compare these approximated species, and consider them relatively to man; some appear as species of immediate utility, others only as auxiliary species, proper in many respects to supply the place of the former, and serve the same purposes. The ass might, in some measure, supply the place of the horse; and should the breed of sheep fail, that of the goat might replace it. The she-goat yields milk like the
ewe,

ewe, and even in greater abundance. Its suet is also of the same kind ; and its hair, though much harsher than wool, makes very useful stuffs. Its skin is better than that of the sheep, and the flesh of the kid is nearly equal to that of the lamb, &c. These auxiliary species are more hardy and robust than the principal : the ass and the goat require far less care and attendance than the horse and the sheep ; they find subsistence every where, and feed indiscriminately on herbage of all kinds ; even on thorny shrubs, and the coarsest plants : they are less affected with the distempers of any climate, and stand less in need of the assistance of man. The less they belong to us, the more they seem to belong to nature ; and instead of thinking that these subaltern species were originally produced by a degeneracy of the first species ; instead of considering the ass as a degenerated horse, there would be more reason in saying, that the horse is an ass improved ; that the sheep is only a more tender and delicate kind of goat, improved by our care, and propagated for our utility : and that, in general, the most perfect species, especially among domestic animals, owe their origin to the less perfect species of such wild creatures to whom they are most similar ; nature alone
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not being able to do so much as nature in concert with man.

But however this be, the goat is a distinct species from the sheep; and is perhaps more distant from it than the ass is from the horse. The he-goat readily copulates with the ewe, as the ass does with the mare; and the ram joins himself with the she-goat, as the stallion does with the she-ass. But though these copulations are sufficiently frequent, and sometimes prolific, no intermediate species has been formed between the goat and the sheep; they are distinct, continue always separated, and always at the same distance, without having been the least altered by such mixtures: they have produced no new branch, no new breeds of intermediate animals; the difference is only in individuals, such as do not in the least affect the unity of the primitive species; but, on the contrary, confirm the reality of their characteristical difference.

There are, however, many cases, where these characteristics cannot be distinguished, nor their differences determined with any certainty. Many others there are, where we are obliged to suspend our judgment; besides an infinity of others, where we are totally in the dark; for exclusive of the uncertainty produced by the

the contrariety of the facts that have been transmitted to us; exclusive of the doubts arising from the want of accuracy in those who have viewed nature, the greatest obstacle to the improvement of our knowledge, is our almost invincible ignorance of a great number of effects, which time alone can never display; and which will not be unfolded even to posterity, unless a combined series of experiments and observations be properly made: in the mean time we grope in the dark, or wander with perplexity between prepossessions and probabilities; ignorant even of the possibility of things, and every moment mistaking the opinions of men for the acts of nature. Multitudes of instances might be produced to support this assertion; but the subject under consideration will be sufficient for the purpose: we know that the he-goat and the sheep copulate, and bring forth; but hitherto no body has told us whether the production be a barren mule, or a prolific animal, capable of producing new generations, or such as resemble the former. Thus, notwithstanding we know that the ram copulates with the she-goat, we are ignorant whether they produce together, and what that production is. We believe that mules in general, that is, animals which owe

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their

their origin to creatures of different species, are barren ; as it does not appear that mules, proceeding from the ass and the mare, as well as those which owe their origin to a copulation of the stallion with the she-ass, produce any thing either among themselves, or with those from whom they are derived: yet this opinion is perhaps ill founded. The ancients positively assert that the mule is able to procreate at the age of seven years, and that he does actually procreate with the mare.* They also tell us that a mule is capable of conception, though it never brings its fruit to maturity.† It is therefore necessary either to confute or confirm these facts, which throw a veil of darkness over the real distinction between animals, and the theory of generation. Besides, had we a clear knowledge of all the species of animals around us, yet we know not what a mixture between themselves, or with foreign animals would produce. We are but little acquainted with the *jumar*, that is, the produce of the cow and the ass, or the mare

* *Mulus septennis implere potest, & jam cum equâ conjunctus hinnum procreavit.* Arist. Hist. Animal. lib. VI. cap. 24.

† *Itaque concipere quidem aliquando mula potest, quod jam factum est; sed enutrire atque in finem perducere non potest. Mas generare interdum potest.* Arist. de Generat. Animal. lib. II. cap. 6.

and the bull. We know not whether the *zebra* would not copulate with the horse or the ass: whether the thick tailed creature known by the name of the *Barbary* ram would not produce with our ewe: whether the chamois be not a species of wild goat; whether it would not with our goat form some intermediate breed; whether monkeys differ in real species; or whether, like dogs, they are all of one and the same species, but varied by a number of different breeds; whether the dog can produce with the fox and the wolf; whether the stag produces with the cow, the hind with the buck, &c. Our ignorance, with regard to all these facts, is, as I have already observed, almost invincible; the experiments by which alone they can be decided requiring more time, more attention and expence than the life and fortune of a common person will admit of. I have for several years been engaged in experiments of this kind; but must allow that they have given me very little insight, and most of them failed; though the whole knowledge of animals depends upon them, as well as the exact division of their species, and the thoroughly understanding of their history; together with the manner of writing it in a proper manner. But as we are de-

prived of those lights so necessary to our design, since we are unable for want of facts to state affinities, and ground our reasonings, we must proceed with caution, survey every animal accurately, account all those which we do not observe to copulate as so many different species, and write their history in separate articles.

For this reason, notwithstanding there are several animals not unlike the sheep and goat, we shall here confine ourselves wholly to the goat and sheep. Whether foreign species could produce and form new breeds, by copulating with our common species, we know not; and therefore we are warranted to consider them as different species, till experience shall shew that the individuals of these foreign species may mingle with the common species, and produce other individuals, which could also propagate among themselves; it being this particular alone which constitutes the reality and unity of what is called a species, both in animals and vegetables.

The goat is naturally more docile and sagacious than the sheep; it comes readily to man, soon grows familiar, shews a sense of caresses and good usage, and is even fond of its benefactors. It is also stronger, more active, and less timorous than the sheep. It is lively, wanton, lascivious,

civious, and roving. Goats are hard to be guided, and are with difficulty kept in herds. They love to lose themselves in deserts, climb craggy mountains, stand, and even sleep on the summits of rocks, and the margins of precipices. The she goat eagerly seeks the male, is ardent in copulation, and yeans very early: she is hardy and easily fed, few sorts of herbs disagreeing with her; yet her constitution, which in all animals has a great influence on the temper, does not seem to be materially different from that of the sheep. These two species of animals, whose internal parts are almost entirely similar, feed, grow, and multiply in the same manner; even their distempers are the same, except a few to which the goat is not subject. No heat incommodes her, she sleeps in the sun; and his most scorching beams neither affect her with vertigoes nor giddiness. She is not terrified with the shock of tempests; bears the rains quietly; but seems a little affected with intense cold. External motions, which, as we have observed, depend much less on the conformation of the body, than on the strength and variety of the sensations relative to appetite and desire, are, for this reason, far more lively and impetuous in the goat than in the sheep. The fickleness

her temper is sufficiently seen from the irregularity of her actions. She walks, stops, runs, skips, leaps, draws near, flies off, appears in sight, hides herself, or flies away, as by caprice, and without any other determining cause than the unaccountable vivacity of her internal sentiments; and all the suppleness of her limbs, and vigour of her body, can hardly answer the wantonness and rapidity of these motions, which are purely natural.

But these animals are so naturally fond of man, that near inhabited places they never become wild, as appears from undoubted experience. In the year 1698, an *English* ship having put in at the island of *Bona Vista*, two negroes came on board, and after some intercourse, told the *English* that they should be welcome to as many he-goats as they pleased.

The captain shewing some surprize at this offer, the negroes answered, that there were only twelve persons on the whole island, while the goats had increased so prodigiously as to become troublesome; and were so far from being difficult to catch, that they would follow a man like tame animals.

The he-goat is capable of engendering at a year old, and the she at seven months; but the kids of this forward commerce are weak
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and defective ; so that they are generally both restrained from copulation till eighteen months, or two years. The he-goat, besides being no despicable animal, is so very vigorous and fallacious, that one will be sufficient for above an hundred and fifty she-goats, during two or three months ; but this ardour consumes him, and never lasts above three or four years ; so that he becomes enervated, and even old, before he has reached his sixth or seventh year.

A he-goat for propagation should be young, and of a good figure ; that is, about two years old, of a large size, his neck short and fleshy, his head slender ; his ears long and lapping ; his thighs large, his legs firm, his hair black, thick and soft, and his beard long and bushy. There is hardly any difference in the she-goats ; but it may be observed, that those of a large body, full rump, large thighs, light head, a capacious udder, long teats, and of a soft and thick hair, are the best. They are usually in heat during the months of *September*, *October*, and *November* ; and even at any time, if they happen to be near the male, they are soon disposed to admit him, as they can copulate and yean at any time of the year. They, however, retain best in autumn ; and the months of *October* and *November* are

also preferred, that the young kids, when they first begin to feed, may find a soft succulent herbage. The she-goat goes five months, yeaining at the beginning of the sixth, and suckle their kids a month or five weeks; so that from the time of their being covered, till the kid is able to feed, forms an interval of six months and a half.

When drove with sheep, they are always observed to lead the flock; but it is better to let them feed separately on rising grounds, as they delight in high places, hills, mountains, and even precipices. The heaths, fallows, commons, and barren grounds, afford them as much food as they want. They must not be suffered to feed in cultivated lands, corn fields, vineyards or woods, as they greedily browse on the young shoots, or the bark. They dread damp places, marshes, and fat pastures. Few are bred in level countries, being generally sickly there, and their flesh of a bad quality.

In most hot climates goats are bred in great quantities, and under no shelter; whereas in *France* the winters would kill them, if not taken into the house. In summer they do very well without litter, but in winter they require it; and as all wet greatly hurts them, they
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are not suffered to lie in their dung; so that fresh litter is often requisite. They are turned out very early, as the dew on the grass, though pernicious to sheep, is very welcome to goats. Their obstinacy and wandering humour is such, that no man, however robust and active he may be, can drive above fifty. In snowy and wet weather they are kept under cover, and fed with herbage, small boughs of trees gathered in autumn, cabbages, turneps, and the like. By feeding plentifully, their milk is increased; and to keep up, or still augment this plenty of milk, water is often given them, mixed with nitre and salt water. They may be milked in a fortnight after yeaning; and during four or five months they yield plenty of milk morning and evening.

The goat generally brings only one kid; sometimes two; very seldom three; and never above four: and it is prolific only from the age of eighteen months to seven years. The he-goat, if suffered to be with the she-goats only at proper times, might retain his generative faculty to that, or even a greater age; but he seldom serves longer than five years, when he is castrated, and sent to fatten with old she-goats, and young he-goats, which are castrated at six months, in order to render

render their flesh more tender and juicy. They are fattened in the same manner as sheep; but whatever care be taken of them, or whatever aliments they feed upon, their flesh is never equal to that of the sheep, unless in hot climates, where mutton is always flabby and ill tasted. The strong smell of the he-goat does not proceed from his flesh, but from his skin. These animals, if suffered to live, might reach ten or twelve years;* but when they are past engendering they are killed; besides, their flesh becomes worse and worse the older they grow. Both he and she-goats have generally horns; though many of both are without them. They also greatly differ in the colour of their coats. Those that are white and without horns are said to yield the most milk; but the black are the strongest and most robust. These creatures are of little or no expence in bringing up, and the value of them not inconsiderable; the flesh, suet, hair and

* This must be a mistake of our author, for Mr. *Walter*, in his account of Lord *Anson's* voyage tells us, that they caught on the island of *Juan Fernandes*, a he-goat, which, from flits in his ears, appeared to have been formerly under the power of one *Selkirk*, who lived several years on the island, and had quitted it above two and thirty years before their arrival. So that goats will live to a much greater age than what our author supposes.

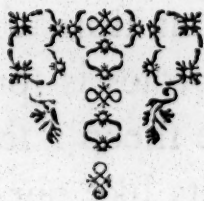
skin,

skin, selling at a good price. Their milk is more wholesome than that of the ewe; it is a part of the *Materia Medica*, easily curdles, and makes excellent cheese; but as it contains only a small proportion of butyrous particles, the cream should not be separated from it. She-goats seem pleased with being sucked, as they often are by children, to whom their milk is an excellent aliment. Like the cows and ewes, they are subject to be sucked by snakes, hedge-hogs, and a bird called the goat-sucker.

Goats have no incisory teeth in their upper jaw; those of the under jaw they shed, and recover at the same time, and in the same order as the sheep. Their age is known by their teeth, and the knots in their horns. In the she-goats, the number of teeth is not always the same, but usually less than in he-goats, whose hair is also harsher, and their beards and horns longer. They have, like the ox and sheep, four stomachs, and chew the cud; and this species is spread much farther than that of the sheep: several parts of the world afford goats like ours, with this exception only, that in *Guinea* and other hot countries they are smaller; whereas in *Muscovy*, and such cold climates they are larger. The

Angora

284 THE NATURAL HISTORY, &c.
Angora and *Syria* goats, with their long pendulous ears, are of the same species with ours, engendering and producing even in our climates. The horns of the males are nearly as long as those of our common he-goats, but of a different form, extending themselves horizontally on each side of the head, and forming spirals like those of a cork screw. In the she-goat the horns are short, and the points bend backward, so as to terminate near the eye, but vary both in their direction and form. The horns of the *Angora* he and she-goat kept in the king's menagary, were such as we have described; and the she-goats, like most other animals of *Syria*, have a very long thick hair, and of such a fineness, that the stuffs made of it are not inferior to our silks, and full as glossy.

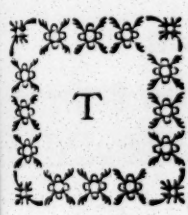




DESCRIPTION

OF THE

H E - G O A T.

HE he-goat is nearly of the same bigness with the ram, and equally resembling it in the internal parts, yet their exteriors differ greatly; and setting aside the difference in their size, the resemblance in figure between the he-goat and the ram, is scarce greater than between the latter and the bull. These three animals have several marks in common, as the organs of rumination, horns, cloven feet, &c. The affinities between them internally, are as many as between the horse and the ass; but in the external figure of the body, and that of the skeleton, the difference is much greater.

The he-goat differs from the ram in the shape of its head, the length and direction of
its

its horns, the thickness of his legs, the quality of his hair, and variety of its length; for the he-goat has a kind of beard under his lower jaw, and a mane along its neck and back to his tail. All these differences it is proper to exhibit in a table of the external parts of the he-goat; but it is not necessary to describe the internal, as they greatly resemble those of the ram. The most usual colours of goats are white and black; some are entirely white, and others wholly black; but generally white and black; and often with a mixture of brown and fallow. The hair is of an unequal length on different parts of the body; everywhere stronger than that of horses, but less harsh than that of the horse's mane. I have seen a he-goat partly white and partly black, with a whitish wool mixed with the hair on the back; and tufts of it on the upper parts of his sides, equal in length to the hair.

The hair of the he-goat I measured, seemed to be more harsh and strong than that of the ass, and the length very unequal; that of the beard being no less than nine inches. This beard formed a tuft beyond the chin, under the corners of the mouth, and reaching three inches along the throat. The hair on the forehead,

forehead, neck, breast, sides, outward surface of the shoulders, and thighs, was about three inches in length. That on the head, (the forehead and beard excepted) the ears, under part of the belly, the inward parts of the legs and thighs, and of the lower parts of the fore legs, from the knees and hocks to the fetlock, was very short; but that on the pasterns, especially on the coronet, was considerably longer. This he-goat had a mane like that of a horse, the hairs falling on each side the neck, and the length of them on the withers six inches. He had also a kind of mane all along the back and rump, to the very extremity of the tail, divided into two lateral parts; the hairs inclining backwards, and a little outwards, and gradually diminishing in length from the withers to the extremity of the tail, where their length was nearly the same with those on the outward surface of the thighs. There was also a kind of continuation of a mane along the hinder part of each thigh to near the ham. This mane consisted of hairs of a middling length; a similar object was seen on the forehead like a tuft.

This he-goat was spotted on the sides of the head with black, white, and fallow. The
external

external surface of the ears and sides of the neck, were partly white, and partly fallow, as were also the sides of the body, haunches, and external parts of the thighs; but on the sides of the body and shoulders, the white prevailed, and in the haunches and thighs, down to the hams the fallow; all the rest of the body was black. Some white hairs were found in the mane, on the middle of the neck; and along the back and rump to the tail, the black hairs were intermixed with fallow. Near the origin of the tail was a transverse list, white and fallow, separating, as it were, the mane from the tail. The colours, however, of these creatures vary in different individuals.

The horns of this he-goat were of a greyish brown, something flattened, but on the hinder and outward side something round, while the anterior was sharp, unequal, and in some parts terminating in tubercles. Each horn had a great number of small wreathed grooves running round it, and very close to one another. The horns, from their bases to some distance from the head, declined gradually from each other, then bending backwards, extended themselves horizontally on each side of the creature; and lastly, formed themselves into a curve, inclining downwards and forwards.

wards. The horns of he-goats differ both in their length and form : most of the she-goats have horns ; and though not so long as those of the he-goats, have the same position and direction.

There are different breeds in the species of the goat, as in that of the horse, though not so numerous. In *France*, few are known, besides those produced by goats brought from *Angora*, which differ from those natural to this climate : the he and she-goat from *Angora* having a very long, fine, wivery hair, glossy as silk, long pendulous ears, and spiral horns, as we have already noted in the natural history of these animals.

The large horns extending above the he-goat's head, and the long beard hanging down from his chin, give him an odd and mysterious look ; but if his face be viewed without regarding the horns or beard, the expressions of his physiognomy are easily known. It will then appear comely ; the part of the face from the eyes to the end of the lips being long and slender, the end of the muzzle properly rounded, the chin finely shaped ; the two lips well separated by the cleft of the mouth, the upper lip well terminated by the apertures of

the nostrils, whose internal extremities approach very near each other, and form a cleft parallel to that of the mouth. All these features are expressive, enliven his physiognomy, and give him an air of vivacity and mildness. The distance between the eyes, though great, does not give him a stupid appearance, from the front's being very narrow, and almost wholly filled up with the tuft. At the same time his eyes are very vivid, remarkably large and prominent, though placed a little on the sides of the head. They even impart the appearance of vivacity more than the shape of the extremity of his muzzle, or his ears, which are well proportioned, and placed in an erect position. The eyes are the most animated feature, the iris being of a fine yellow, and the pupil of a singular form; that is, of an oblong square, the sides being unequal, and, as it were, fringed, and the angles round. This square is generally so placed, that the lower anterior angle is nearly equal in height to the anterior angle of the eye; and the upper posterior angles of an equal height with the posterior angle of the eye.

Let us now take a view of the he-goat, decorated with his horns and beard; and we shall find that the face will appear transversely divided

divided in the middle, and as it were double. The air of the physiognomy becomes equivocal; the appearance of vivacity and cunning changing into a heavy, blockish look, as we shall now explain. The whole extent of the forehead, from the eyes to the nostrils, being bare and simple; the eyes seem to belong to the upper part of the face, which serves as a basis to the horns; and with the forehead, the ears and horns, to form a distinct group from the lower part of the face, which being connected with the beard, forms another group, consisting of the nostrils, lips, chin, and beard. Now, if we cover this part of the face, and view only the upper, the overgrown largeness of the horns drowns, as it were, the proportion of the ears, the vivacity of the eyes, and the smallness of the forehead. These three parts, which, considered separately from the horns, indicated agility and vivacity, lose their effect when surmounted by the horns: we have no longer any idea of spirit and agility, but the whole seen at one view, appears sluggish and stupid. Let us now examine the alteration of the lower part of the he-goat's face, when viewed separately from the upper part, and the horns. The nostrils and mouth, which are strongly express'd, and with the

beard form a group, being no longer softened with the features of the upper part of the face, will then, instead of the air of docility and cunning, denoted by the muzzle of the he-goat, when joined to the rest of the face and the beard, shew only an appearance of dullness and obstinacy. Hence it is, that the whole face, with the horns and beard, as in its natural state, presents only an odd and equivocal physiognomy, which, when the head is seen in profile, with the muzzle projecting over and beyond the beard, exhibits the appearance of melancholy and dejection.

In general, the body of the he-goat appears either too little or too large, too little in proportion to its horns, and too large in proportion to the height of its legs, which are very short, especially those before, the withers being lower than the haunches. His slender neck, and small pendulous head, seem overloaded by the horns, which are much too large in proportion to the body. Another disproportion in the he-goat is, that the reins, haunches, rump and thighs; in a word, all the hinder parts of the body, appear too large, and the hind-legs too long for the rest of the body. Besides, the knees bending inwards, and the shortness of the legs, gives them the appearance

ance of weakness; at the same time the fore-feet are much larger than the hinder. The he-goat, however, presents his horns with gracefulness, and readily weilds them from side to side. His attitude of stooping, when he presents his horns, becomes him; he lifts his fore-legs with great ease, and in all his motions shews great suppleness and agility.

The size of he-goats, like that of rams, is different: that which I chose for taking the dimensions was of a middle size, and the external parts of the body were as follows:

	Feet	Inch.	Lines.
Length of the whole body from the muzzle to the anus	4	0	1
Height of the fore part of the body	2	2	0
Height of the hinder part	2	3	0
Length of the head from the tip of the muzzle to the hinder part of the horns	0	9	0
Circumference of the muzzle above the nostrils	0	9	0
Contour of the mouth	0	5	6
Distance between the angles of the lower jaw	0	2	6
Distance between the upper part of the nostrils	0	0	3

U 3

Distance

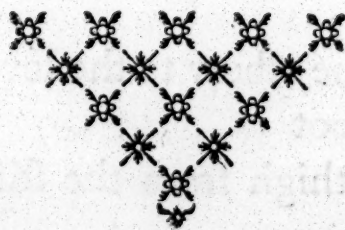
	Feet	Inch.	Lines,
Distance between the lower parts	0	1	3
Length of the eye from one angle to the other	0	1	2
Distance between the two eye-lids when open	0	0	8
Distance between the anterior angle and the end of the lips	0	5	6
Distance between the posterior angle and the ear	0	2	0
Distance between the anterior angles of the eyes measured in a right line	0	4	0
Distance following the curve of the forehead	0	5	3
Circumference of the head taken below the horns and the ears	1	4	0
Length of the ears	0	5	0
Largeness of the base, as measured on the outward curve	0	3	0
Distance between the bases of the ears	0	4	0
Length of the neck	0	11	0
Circumference near the head	1	2	0
Circumference near the shoulders	1	7	0
Breadth	0	6	0
Circumference of the body behind the fore-legs	2	8	0
Circumference of the largest part	3	0	0
Circumference before the hind-legs	2	9	0
		Length	

		Feet	Inch.	Lines.
3	Length of the dock of the tail	0	6	0
	Thickness of the upper part of the tail	0	1	6
2	Length of the fore-leg from the elbow to the knee	0	9	0
8	Circumference at the thickest part	0	7	0
	Circumference of the knee	0	5	6
6	Length of the shank	0	4	0
	Circumference of the slenderest part	0	3	6
0	Circumference of the pastern joint	0	4	0
	Length of the pastern	0	1	8
	Circumference of the pastern	0	4	6
0	Circumference of the coronet	0	6	0
	Height from the lower part of the foot to the knee	0	8	0
5 3	Distance from the elbow to the withers	0	10	0
4 0	Distance from the elbow to the lower part of the foot	0	5	0
5 0	Length of the thigh from the stifle to the ham	0	11	0
3 0	Circumference near the belly	0	11	0
4 0	Length of the shank from the ham to the fetlock	0	8	0
1 0	Circumference	0	4	0
2 0	Height of the hoofs	0	1	4
7 0	Length from the toe to the heel in the fore-feet	0	2	3
6 0				
9 0				
length				

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Length

	Feet	Inch.	Lines.
Length from the toe to the heel in the hind-feet	0	2	3
Breadth of the two fore hoofs together	0	1	9
Breadth of ditto in the hind-feet	0	1	5
Distance between the two hoofs	0	0	9
Circumference of the two hoofs conjointly of the fore-feet	0	6	6
Circumference of ditto of the hinder feet	0	6	3





T H E
N A T U R A L H I S T O R Y
O F T H E
H O G, the Siam H O G, and the
wild B O A R.

 F we put the hog, the *Siam* hog, and the wild boar together, it is because they are all three of the same species. One is the animal in its wild state, and the two others the same animal when tamed; and however they may differ in some external marks, perhaps also in some qualities; yet as these differences are not essential, but relative only to their state; and as their nature suffers no remarkable change in their domestic state; and, lastly, as they can by copulation produce individuals capable of producing others, the very constituent character of unity in any species; we thought proper not to separate them.

These

These creatures are singular; their species may be said to be alone and independent, bordering on no other species which may be considered either as principal or accessory; such as the species of the horse, relatively considered with regard to that of the ass; or the goat, relatively to that of the sheep. It affords no great variety of breeds like that of the dog; it partakes of several species, and yet essentially differs from all. Let those who are for comprehending nature in narrow systems, who would confine its immensity within a model, take, with us, a view of this animal, and then ingenuously say, if it be not an exception to all their methods. In its extremities it differs from those called *solipedes*, by having the foot cloven; and it is not like those called cloven-footed, having really four toes; though to outward appearance only two. Nor can it be classed with those called *fissipedes*, as walking on two toes only; the two others being neither placed or extended like those of the *fissipedes*; nor are they of a sufficient length to be made use of. Thus it has equivocal and ambiguous marks, some apparent and others obscure. These phalanges, as not being sufficiently extended, cannot be looked upon as an oversight in nature, and therefore not reckoned;

reckoned; for this is perpetual and universal. besides, this creature differs from the cloven-footed, in the other bones of the feet, and even by the most striking marks; for the latter have horns, are without incisory teeth in their upper jaw; they have four stomachs; they chew the cud, &c. The hog is without horns; its upper teeth resemble the lower. It has but one stomach, and never chews the cud. Thus it appears to belong neither to the *solipede*, or cloven-footed kind. Nor is it a branch of the *fissipedes*, differing from these animals not only in the extremities of the feet, but also in the teeth, stomach, intestines, the internal parts of generation, &c.

All that might be said is, that in some respects it forms the gradation between the *solipedes* and cloven-footed; and in other respects between the cloven-footed and *fissipedes*. For in the order and number of teeth it differs less from the *solipedes* than the others, resembling them still further in the length of the jaws. Like them it has only one stomach, though much larger; but in an appendix adhering to it, and the position of the intestines, it seems to have an affinity with the cloven-footed or ruminant animals, whom it also resembles in the external parts of generation; and at the
same

same time in the shape of the legs, habit of body, and the numerous produce of generation, it comes near the *fissipedes*. The first who divided animals into *solipedes*, cloven-footed, and *fissipedes*, was *Aristotle*,* and he allows the hog to be of an ambiguous kind; but the only reason he gives is, that in *Illyria*, *Pæonia*, and some other places, *solipede* hogs are found. This creature is also a kind of exception to two general rules of nature, namely, that the larger animals are, the less they produce; and that of all animals the *fissipedes* are the most prolific. The hog, though considerably above the middle size, produces more than any *fissipede*, or indeed than any kind of animals; and by this fecundity, and the conformation of the testicles of the boar, or ovaria of the sow, it seems to constitute the extremity of the viviparous kind, and to border on the oviparous. In

* Quadrupedum autem, quæ sanguine constant, eadem quæ animal generant, alia multifida sunt; quales hominis manus pedesque habentur. Sunt enim quæ multiplici pedum fissurâ digitentur, ut canis, leo, panthera. Alia bisulca sunt, quæ forcipem pro angula habeant, ut oves, capræ, cervi, qui fluviatiles. Alia infisso sunt pede, ut quæ solipedes nominantur, ut equus, mulus. Genus sanè suillum ambiguum est; nam et in terra Illyriorum, & in Pæonia, & nonnullis aliis locis, fues solipedes gignuntur. *Arist. de hist. animal. lib. II. cap. I.*

short,

short, it is in every particular of an equivocal and ambiguous nature; or rather will appear so to those who think that the hypothetical order of their ideas constitutes the real order of things; who in the infinite chain of beings, see only some prominent points, and to these they would refer every thing.

It is not by contracting the sphere of nature, and inclosing it within a narrow circle, that we can attain the knowledge of it; it is not by making it act according to particular views, that we shall be able to judge of its proceedings. The views of its great Author are not to be fathomed by attributing to him our ideas: instead of curtailing the limits of his power, they must be widened, extended to immensity. We are to consider nothing impossible; we are to imagine every thing, and to suppose that whatever can be, is. Ambiguous species, irregular productions, anomalous beings, will then cease to stagger us; and will be found in the infinite order of things as necessarily as others. They fill up the intervals of the chain; they form the links, the intermediate points, and also indicate the extremities. These beings are to the human mind valuable and singular copies, in which nature, though apparently less consistent

stent with her usual method, shews herself more openly; in which we may perceive marks and characters denoting her ends to be much more general than our views; and that, as she does nothing in vain, she also does nothing with the designs we impute to her.

In effect, do not the premises deserve our attention? Does not this singular conformation of the hog afford us instructive lessons? It does not seem to have been formed on an original, particular, and perfect plan, being a compound of the other animals. Some of its parts are evidently useless, or rather such as it cannot use. All the bones in its toes are perfect, but of no use. Nature, in the composition of beings, is far from subjecting herself to final causes. Why, therefore, may not superabundant parts be sometimes added, when essential parts are so often omitted? How many animals are there without sense and limbs? Why then, in every individual, must every part be useful to the others, and useful to the whole? Is it not sufficient for their being together, that they do not hurt each other; that they may be expanded, and grow without mutually destroying or obliterating each other? Whatever hurts not any thing

thing so as to destroy it, all that can subsist together does subsist; and in most beings the relative, useful, or necessary parts, are perhaps fewer than the indifferent, useless, or superabundant parts; but as we are always for referring every thing to a certain end, when the parts are without any apparent uses, we suppose some latent uses for them; we imagine relations without any grounds, which have no existence in the nature of things, and only serve to obscure it. We do not reflect that we corrupt philosophy; that we change the very nature of its object, which is, to know the *how* of things, or the manner of nature's acting, substituting in the place of this real object, an empty idea, visionary endeavours for guessing at the *wherefore* of facts, or the end she proposes in her actions.

It is on this account that we shall carefully collect the instances which check such pretensions; that we shall dwell on facts capable of overthrowing a general prejudice we fondly embrace; an error in method which we adopt by choice, though tending only to conceal our ignorance; of no use, and even unfavourable to the investigation and discovery of natural effects. Without wandering from our subject, other instances may be produced, to
prove

prove the falsity of those ends which we arrogantly attribute to nature.

It is said that the phalanges are made only for the formation of the toes; but in the hog we see useless phalanges, as forming toes of no manner of use; and in cloven-footed animals there are small bones, which do not even form phalanges. If this be the scope of nature, is it not evident that in the hog she has performed only half her plan, and scarce given us a sketch of it?

The *allantoïdes* is a membrane found in the production of the sow, mare, cow, and several other animals, adhering to the bottom of the bladder of the foetus; and the end of it is said to be appointed for receiving its urine, during its abode in the womb of its dam. And it is certain, that at the instant of parturition a portion of some fluid is found in this membrane, but in no large quantity. At the calving of a cow, where it probably abounds more than in any other animal, it does not exceed a few quarts; between which, and the capacity of the *allantoïdes*, there is no proportion: this membrane, when filled with air, forms a kind of double bag, in the figure of a crescent, thirteen or fourteen feet long, to a diameter of nine, ten, eleven or even

even twelve inches. Now, why should a vessel of such capacity be formed to hold two or three quarts of liquor? The bladder of the foetus, if it had not been perforated at the bottom, would have been sufficient for holding this small quantity of fluid, as it is known to be sufficient in man and other animals, in which no *allantoides* has been yet discovered. It was not therefore to receive the urine of the foetus; or even for any other of our supposed views that this membrane was made. For such capacity is not only useless in this intention, but also in any other; there not being the least reason to suppose that it could ever be filled; for were it full, it would form a volume nearly as large as the body of the animal which contains it, and consequently could not be contained in it: as it lacerates at the moment of the birth, and is thrown away with other membranes in which the foetus was enveloped, it is even then more useless than before.

The number of teats is in each species of animals said to be proportioned to the number of young the female is to bring forth and suckle: but the male producing nothing, why has it in general the same number of teats? And the sow, which often farrows

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eighteen,

eighteen, and sometimes twenty pigs, why has she only twelve teats? For she has often less, but never more. Does not this prove that it is not from final causes that we can judge of nature's works? That we are not to impute to her such narrow views, nor make her act from moral relations, but examine how she really acts; and, in order to know this, make use of all the physical conformities offered to us in the immense variety of her productions? This method, the only one that can lead us to any real knowledge, is, I own, incomparably more difficult than the other; and that in nature there are an infinite number of facts, to which, as to the foregoing instances, it seems scarce possible to apply it with success. Yet, instead of endeavouring to discover the use of the vast capacity of the *allantoïdes*, and after all, finding it can be of none, we should apply ourselves only to examine those physical relations which may discover to us what may be the origin of it. By observing, for instance, that in the product at the generation of animals, which have no great capacity of stomach or intestines, there is no *allantoïdes*, or very small, that consequently the production of this membrane has some relation to the capacity

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tioufness of the intestines, &c. So also on observing that the number of teats is not equal to the number of young, and allowing only that the most prolific animals are also those which have the greatest number of teats, this numerous production may be said to depend on the conformation of the internal parts of generation; and that the teats being also external dependencies on the same parts of generation, there is between the number and order of these parts, and that of the teats, a physical relation, the discovery of which must be investigated.

But I shall only here point out the true method of proceeding in this investigation, as this is not the place to prosecute it farther. I cannot, however, forbear observing cursorily, that I have some reason to suppose, that a numerous production depends more on the conformation of the internal parts of generation than on any other cause; for the multiplicity of the production does not proceed from the abundant quantity of the seminal fluids; for the horse, the stag, the ram, the he-goat, and some other animals, which have a very great flux of seminal liquor, engender very sparingly; while the dog, the cat, and other animals, with a much less quantity of seminal

fluid in proportion to their size, produce great numbers. Neither does the number depend on the frequency of copulation, it being well known that the swine and dog produce a great number of young by one copulation only. Nor is it to be imputed to the continuance of the copulation, or rather the time spent in the emission of the seminal fluid; for if the dog continues a long time in copulation, it is owing to his being detained by an obstacle arising from the conformation of the parts themselves; and though no such obstacle be found in the hog, which however remains longer in copulation than most other animals, nothing can be concluded from it with regard to the numerous production; because a cock in a single instant, fecundates all the eggs a hen can lay in a month.

To the singularities already remarked, it will be proper to add another, *viz.* that the fat of a hog differs from that of almost every other quadruped; not only in its consistence and quality, but also in its position in the animal's body. The fat of men, and other animals which have no suet, as the dog, the horse, &c. is pretty equally blended with the flesh. In the ram, the he-goat, the stag, &c. the suet is lodged only at the extremities of

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the flesh; but the hog's fat is neither blended with the flesh, nor collected at its extremities; it covers it every where, forming a thick, distinct, and continuous stratum between the flesh and skin. This the hog has in common with the whale, and other cetaceous animals. Their fat is only a kind of seam, and nearly of the same consistence, but more oily than that of the hog; and in the cetaceous animals, this fat also forms under the skin a stratum several inches in thickness, enclosing the flesh.

Another singularity, and even greater than any of the preceding is, that a hog never sheds any of its first teeth; while other animals, as the horse, the ass, the ox, the sheep, the goat, the dog, and even man, lose all the first incisory teeth; they shed them before the age of puberty, and they are soon re-placed by others. In the hog these sucking teeth, instead of falling out, continue growing during its whole life. It has six teeth in the fore-part of the lower jaw, which are sharp and incisive, and six in the upper jaw answering to them; but by an imperfection, of which nature does not afford another instance, the six teeth of the upper jaw are very differently shaped from those of the lower; instead of

being incisive and sharp, they are long, cylindrical, and blunt at the point, forming nearly a right angle with those of the lower jaw; so that their extremities touch each other very obliquely.

The hog, and two or three other species of animals, are the only ones which have tusks, or long canine teeth. These differ from the other teeth, by projecting outwards, and growing during the animal's life. In the *manata*, or sea cow, and the elephant, they are cylindrical, and several feet in length; in the wild boar and common hog, they are curved, flat, and sharp; and some of them nine or ten inches in length: they are placed very deep in their sockets, and, like those of the elephant, have a cavity in their upper extremity. But the elephant and *manata* have tusks only in the upper jaw, but not even canine teeth in the lower; whereas the hog and wild boar have them in both jaws; and those in the lower are of the greatest use to the creature: they are also the most dangerous, it being with the lower tusks that the creature wounds his antagonist.

The wild sow, and even the common sow spayed, have also these four canine teeth in the lower jaw; but they grow much less than those

those of the male, and are scarce visible on the outside. Besides these sixteen teeth, *viz.* twelve incisive and four canine, they have twenty-eight jaw teeth, the whole amounting to forty-four. In the wild boar the tusks are larger, the snout larger, and head longer than in the common boar; its legs are also thicker, the toes more separated, and its coat always black.

Of all the known quadrupeds, the hog appears the most brutish. The defects of its figure seem to influence its disposition. All its actions are coarse, its inclinations filthy, and its sensations all concentrate in a furious lust, and a blind gluttony, devouring indiscriminately whatever comes in its way, and even its very offspring immediately after the birth. Its voracity seems to be owing to a continual desire of filling the vast capacity of its stomach, and to the obtuseness and hebetation of the senses of taste and touch. The harshness of the hair, the hardness of the skin, with the thickness of the fat, render these animals little sensible of blows. Mice have been known to lodge themselves on their backs, and eat their very skin and fat, without their shewing any signs of feeling them. The sense of feeling therefore must be very dull or obtuse, and their taste as bad as their feeling; but their

other senses acute and quick. The huntsmen knowing the wild boars see, hear, and smell at a great distance, watch for them in the night, observing a profound silence, and placing themselves to leeward, that they may not scent the effluvia, which affect their organs of smelling so strongly at a considerable distance, that immediately, as if aware of some impending danger, they betake themselves to flight.

The defect in the senses of the taste and touch is further increased by a distemper, which renders them also absolutely insensible, and which is not perhaps so much owing to the texture of their skin, as to their filthiness, and the corruption flowing from the putrid aliments on which they often feed : for neither the wild boar, which has no such ordure to feed on, subsisting generally on acorns, mast, and roots, is subject to this distemper, nor a sucking pig. There is, however, no other way of preventing the common hog from such foul feeding, than by keeping it in a clean sty, and giving it plenty of wholesome food. By this means its flesh will acquire an exquisite flavour, and the fat be firm and palatable; especially if, as I have seen, it be kept a fortnight or three weeks before killing, in a clean
paved

paved stye, without litter, and fed only with pure dry wheat, allowing it at the same time very little drink. A sow about a year old should be chosen for this experiment, full of flesh, and about half fatted. The common way of fattening them is, to give them plenty of barley, mast, cabbage, and other greens boiled, and a large quantity of water mixed with bran. By this means they are sufficiently fat in two months, having acquired a thick stratum of seam, but neither very firm nor very white; and the flesh, though good, is flabby. They may also be fatted at less expence in countries which abound in mast, by driving them to the forests in autumn, when the acorns, wild chesnuts and beech-mast are ripe. They eat all kinds of wild fruits, and grow fat in a small time; especially if at their return in the evening lukewarm water be given them mixed with a little bran and the meal of tares, which causes them to sleep, and increases the flesh so remarkably, that they are sometimes scarce able to move. They also fatten much sooner in autumn, when the cold weather begins to set in, because the perspiration is then much less than in summer, and aliments are in the greatest plenty.

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In other species of cattle, the proper age must be observed; but it is otherwise with regard to the hog; the older it grows the longer time it requires to fatten, and the flesh is proportionably worse. Castration, which must always precede the fattening, is usually performed at the age of six months, and either in spring or autumn; but never in the time of great heat or cold, which equally renders the wound dangerous, or difficult to heal, this operation being performed by incision, though sometimes by a ligature only, as we have before observed with regard to the ram. If the operation was performed in spring, the creatures are generally fatted the very next autumn, and commonly killed before they are two years old; tho' they grow very considerably in the second year, and would continue to grow the third, fourth, fifth, &c. Those which are particularly remarkable for their height and corpulence, are only creatures of a greater age, which have been several years turned out to feed on mast. Their time of growth does not seem confined to four or five years; the boars kept for propagation continuing to grow five or six years; and the older a wild boar is, the larger and heavier he is.

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It is not uncommon for boars to live twenty-five or thirty years. *Aristotle* says, that hogs in general live twenty years; and adds, that the boars ingender, and the sows bring forth, till the age of fifteen. They are able to copulate so early as nine months, or a year; but it is better to let them first double that age. The first litter of a sow, when she is not a year old, consists only of a few, and those weak, and even defective. She may be said to be in heat at all times; and even when pregnant seeks the boar, which, among animals may be considered as an excess; the female in almost every species refusing the male on conception. The heat of the sow, which is almost continual, declares itself at intervals, and by immoderate motions, which always end with the animals weltering in the mire. She emits no small quantity of a thick whitish liquid. She goes four months, and farrows at the beginning of the fifth; soon after she again grows eager for the male, becomes pregnant a second time, and thus farrowstwice a year. The wild sow, which in all other respects resembles the former, farrows only once a year; owing probably to the scarcity of food, and the necessity she is under of suckling and feeding for a considerable time all her litter.

Whereas

It

Whereas the tame sow is never suffered to suckle all her pigs above a fortnight or three weeks, when eight or nine only are left with her, the rest being carried to market. In a fortnight they are fit for eating; and as few sows are wanting, the castrated the more profitable, and their flesh the best, most of the sow pigs are disposed of, two only, and seven or eight boar pigs being generally left with the sow.

The boar made choice of for propagating the species, should be of a short thick body, and rather square than long; have a large head, a flat short snout, large flagging ears, small fiery eyes, a large thick neck, a swagging belly, broad buttocks, short thick legs, and thick and black bristles, white hogs being never so strong as the black. In the sow the body should be long, the belly broad and capacious, and the teats long. She should also be of a quiet disposition, and taken from a fruitful brood. When pregnant she must be taken from the boar, as he would in all probability do her some mischief; and when she has farrowed, be fed plentifully, and also watched, lest she should devour some of her pigs; the boar especially must be removed, as he would shew them still less mercy.

mercy. She is put to the boar at the beginning of the spring, that by farrowing in summer, her pigs may have time to grow, and gather strength and flesh before winter. But when it is intended that she should farrow twice a year, she is had to the boar in the month of *November*, that she may farrow in the month of *March*, and be again put to the boar in the month of *May*. Some fows are known to farrow regularly every five months. The wild sow, which, as we have already observed, farrows only once a year, admits the boar in the months of *January* or *February*, and farrows in *May* or *June*. She suckles her young for three or four months, leads them abroad, follows them, and keeps them from straying, till they are three or four years old; so that it is nothing extraordinary to see wild fows with their young of the current and preceding year about them. The tame sow is never permitted to suckle any of her pigs above two months; and even at the end of three weeks they are drove to the field with the sow, that they may by degrees habituate themselves to feed like her. About five weeks after, they are weaned, and have whey mixed with bran given them morning and evening,

evening, or at least some warm water boiled with greens.

These animals are very fond of worms, and some particular roots, especially those of the wild carrot; and in order to find these, they turn up the earth with their snouts. The wild boar, whose head is more strong, and of a greater length, digs to a greater depth, and generally continues the furrow in a right line; whereas the hog digs here and there, and at the same time more slightly. But as they do a great deal of damage by this means, they must be carefully kept from cultivated fields, and suffered only to run among the woods and fallowed lands.

Wild boars, when under three years old, are called beasts of company, because they keep together till that age, and follow their common mother, never going alone till they are strong enough to encounter the wolf. Thus these animals form a kind of squadrons among themselves, and in this their safety consists. When attacked, the largest form themselves into a close circle, placing the lesser in the center. The same method of defence is also used by the tame hogs; so that there is no occasion to make use of dogs to secure them from beasts of prey; but being stubborn and untractable,

untractable, an active man cannot well take care of more than fifty. In autumn and winter they are drove to such woods as afford plenty of wild fruits. In summer the best feeding place for them is moist and marshy places, as they there find worms and roots. In spring they traverse the fallow fields. From the month of *March* to *October*, they are driven out twice a day, feeding in the morning from the time the dew is exhaled till ten o'clock, and from two in the afternoon till evening. In winter, when the weather is fine, they go abroad once a day, the dew, snow and rain being hurtful to them. If a sudden storm comes on, or only a heavy shower of rain falls, it is common to see them flying for shelter, and every one endeavouring to provide for himself; running full speed, and continually crying out, till they reach their sty. The youngest cry the most, and also the loudest; and this cry is very different from their usual grunting: it is a cry of grief, resembling that when they are bound in order to be killed. The boar cries less than the sow; and the wild boar is seldom heard to cry, unless when wounded in fighting with another. The wild sow cries more frequently; and both when surprized and terrified, snort with such vehemence,

mence, as to be heard at a considerable distance.

Gluttonous and greedy as these creatures are, they do not, like the wolves, attack and devour other animals; though they will sometimes eat putrid flesh; wild boars have also been seen feeding on horses; and we have found in their stomachs pieces of wild goats skin, and birds feet. But this, perhaps, is rather owing to necessity than instinct; tho' it must be owned they feed greedily on blood and sanguinous flesh; hogs too often eating their young, and even young children in the cradle. Whenever they meet with any thing juicy, moist, fat, or unctuous, they begin with licking, but soon devour it. I have several times seen a whole herd of these creatures, at their return from the fields, stop and gather round a heap of clay newly dug up, all of them licking this earth, though none of the most unctuous, and some of them swallowing a pretty large quantity. This demonstrates their gluttony to be of a piece with their brutal nature. They have not one clear sentiment; the young hardly know their dam, or at least are very apt to mistake, and readily suck the first sow that will permit them. Fear and necessity very probably impart a
little

little more instinct and sentiment to the wild race of hogs; the young are faithfully attached to their mother, and she, on her part, shews herself more careful to provide for their wants than the tame sow. In briming time, the boar seeks and follows the sow, and usually continues with her thirty days, in the most sequestered parts of the thickest forests. This is the season of its greatest ferocity, which even increases to fury when another boar offers to take his place; so that one of the two creatures is often killed on the spot. With regard to the wild sow, some attack must be made on her pigs, in order to excite her rage. And, in general, the male of all wild animals becomes more or less ferocious about the time of copulation; but the female soon after her bringing forth.

The wild boar is hunted openly with dogs, or surprized and killed by moon-light. As he is not remarkably swift of foot, he leaves a very strong scent, and in his defence often dangerously wounds the dogs; the good hounds used for the stag and roe-buck should not be employed in this hunting, as it spoils their scent, and breaks them to a slow chase. Mastiffs, after a little training, will be useful in hunting the wild boar; but only the oldest of

Y

these

these animals are to be attacked, and these are easily known by their tracks; a wild boar of three years is not easily run down, he paces over a great deal of ground before he stops; whereas an old boar does not run far; suffers the dogs to come near him, and often stops to keep them at bay. In the day-time he generally keeps in his soil, which is situated in the thickest part of the wood, and at the fall of night he goes out in quest of food. In summer, when the grain is ripe, it is no difficulty to surprize him among the corn and oats, which he is sure to visit every night. As soon as he is killed, the huntsmen cut out his testicles; the smell of which is so strong, that if left only five or six hours, all the flesh of the body is infected by it. The head only of an old boar is worth eating: whereas all the flesh of the wild boar and sow, not a year old, is delicate, and of a fine grain. The flesh of the tame boar is still worse than that of the old wild boar, and can be rendered eatable only by castration and fattening.

The ancients used to castrate such wild pigs as they could at any time find means to steal away from their mother; and afterwards carried them back into the woods: the castrated hogs not only exceeding the others in bigness,

bigness, but their flesh was also better than that of the tame hogs.

They who have lived in the country, must be acquainted with the several advantages arising from keeping a hog. Its flesh sells for rather more than that of the ox; the lard almost double the price. The blood, guts, viscera, feet, and tongue, are dressed and eat. Hog's dung is of a colder nature than that of other animals, and should be used only on a hot and dry soil. The fat of the intestines and the caul, which is very different from the lard, makes the hog's grease. Nor is the skin without its uses, sieves being made of it; and the bristles make brushes of different kinds. The flesh of this creature takes salt and saltpetre better than any other, and keeps longer in this state.

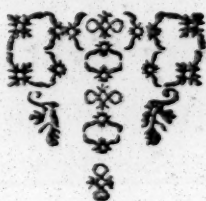
This species of animals, though known, and even found in great plenty all over *Europe*, *Asia* and *Africa*, was not seen in *America*, till carried thither by the *Spaniards*, who turned great numbers of black pigs loose on the continent, and also on the larger islands, where they have increased prodigiously, and in several parts become wild. They resemble our wild boars, but their body is shorter, their head larger, and their skin thicker than other

hogs, which in hot climates are totally black, like the wild boars.

A ridiculous prejudice, which owes its continuance to superstition, deprives the *Mahometans* of this animal; they are taught to consider it as unclean, and are so far from eating, that they dare not touch it. The *Chinese*, on the contrary, are very fond of hog's flesh; it is their most common food, and is said to have animated them to refuse the doctrine of *Mahomet*. The *Chinese* hogs, which are the same with those of *Siam* and *India*, differ something from those of *Europe*. They are smaller, their legs much shorter, their flesh far whiter and more tender. They are well known in *France*, and some persons breed them: they copulate and engender with our common swine. The *Negroes* also breed vast numbers of hogs; and though among the *Moors*, and all the *Mahometan* countries they are very scarce, wild boars abound as much in *Asia* and *Africa* as in *Europe*.

Thus these creatures are not limited to any particular climate; but it appears that in cold climates the boar, by being made a tame animal, has degenerated more than in the hot. The difference of one single degree of temperature alters their colour. The swine in the
southern

southern provinces of *France*, and even in *Vivarais*, are generally white; while those in the province of *Dauphine*, which lies very near it, are almost all of them black. Those of *Languedoc*, *Provence*, *Spain*, *Italy*, *India*, *China* and *America*, are also of the same colour. The *Siam* breed resemble the wild boar considerably more than the *French*. One of the most evident marks of degeneracy are the ears. The more the animal is vitiated, or if that be thought better, the more it is softened by domestic attention, the more the ears become soft and flagging: and accordingly the ears of the tame hog are less stiff, much longer and pendent than those of the boar, which must be considered as the model of the species.





D E S C R I P T I O N
O F T H E
H O G.

THE wild boar, the *Siam* hog, and
T the common hog, are three breeds
of the same species; for all these
creatures copulate together, and their produce
also propagate their species. The more accu-
rately they are observed, both externally and
internally, the more we are convinced that
they resemble each other in every mark of the
common species. The differences found be-
tween them are very slight: the wild boar is
the original from whence the others were
produced, and carries the marks of the spe-
cies without alteration; whereas both the
common and *Siam* hog has undergone some
changes from their being tamed.

The swine has been classed among cloven-
footed animals, as having on each foot only
two

two toes that touch the ground. The last phalanx of each toe is inclosed in a horny substance; and if the hog's feet be considered only externally, they seem to be nearly similar with those of the ox, the goat, the sheep, &c. but, on removing the skin, a very great difference is perceived, the metacarpus and metatarsus having four bones, and four toes, each composed of three complete phalanges; the two middle toes are longer than the others, and each has a hoof bearing on the ground; the two others are much shorter, and their extreme phalanx is invested with horn like that of the hoof; but placed higher, so as not to touch the ground.

Another difference between the hog and cloven-footed beasts is, that it has no horns; that its upper jaw has the incisive teeth, and its lower jaw the canine; that it has but one stomach, besides other internal differences: but at the same time it has also some remarkable resemblances.

The hog's coat consists of coarse bristles, erect and pliable. Their nature is much harsher than that either of common hair or wool; the substance of them seems cartilaginous, and even something analogous to that

of horn. At the extremities, they split into several filaments, sometimes amounting to seven or eight in number, and six or eight lines in length; and, by separating these filaments, every bristle may be split from one end to the other. The thickest and longest bristles form a sort of mane, running from the top of the head, all along the neck and back, to the tail. Among the bristles of the wild boars grows a shorter hair, very supple, and of various colours, yellowish, ash-colour, or black, according to the age of the animal. This hair is soft, and curls in the manner of wool: neither the common nor *Siam* hogs have any of it. The usual colours of the bristles are a dirty white, a pale yellow, dun, brown, or black.

The *founder*, or wild boar of the first year, has colours which afterward are lost; and these they term the livery. They are conspicuous in the foetus on its being covered with hair, and ranged in stripes from the head to the tail. These stripes are alternately of a light dun, and a dun mixed with brown: that which passes near the withers to the tail, is blackish; but all the other parts of the animal are a mixture of white, dun, and brown.

When

When the young boars are out of livery, the head usually assumes a mixture of grey, dun, and black. The longest bristles are on the neck, and these are about four inches in length: the greatest part of each bristle is black, which is succeeded by grey, and afterwards by a dun colour, which reaches to the extremity of the bristle. When the bristles are placed one against another, these three colours seem intermixed. The body is dun, decorated with brown and blackish spots, from each of the bristle's being partly dun, and partly blackish. The tail is of a pale-fallow colour, except the extremity, which is black, as are also the lower parts of the legs.

A wild boar, weighing 257 pounds, and whose length in a right line, from the snout to the origin of the tail, was five feet eight inches, and the circumference of the thickest part of the body four feet two inches, had his snout and ears black; the rest of the head spotted with white, yellow, and black; and the throat dun. The bristles on his back were three inches and a half in length, and wholly black to the distance of two inches from the root; above this was a dirty white; and at the extremity a brownish dun. All these bristles inclined backwards, closely covering

covering each other; so that nothing was seen, except the brown at the extremities. The bristles on the sides and belly were only three inches in length, and their colours the same with those on the back; but tho' these also inclined backwards, both the white and brown were seen, being at a greater distance from one another than those on the back. The bristles on the inner parts of the fore and hind-legs were of a pale-dun colour; those of the belly, the inner surface of the thighs and scrotum, appeared also of the same colour, tho' the greater part of them were white, and only tipped with dun; and the others black, white, and dun. The head, the extremity of the tail, and the lower parts of the legs, were black. The bristles at the extremity of a wild sow's tail were no less than seven inches in length.

A *Siam* hog, three feet eight inches and an half in length, measured in a right line, from the snout to the origin of the tail, had bristles six inches long on the neck and back; but the length of those on the upper part of the head and buttocks, was about two or three inches, and the others not above one or two inches. The sides of the head, under-part of the head, breast, belly, inner surface of
the

the legs, &c. were very thin of bristles, and some parts intirely bare: all the bristles were black, except a few between the eyes, which were white, and those on the lips, extremity of the tail and feet, which were yellowish, like those of most tame hogs. There is reason to think, that this yellowish colour was derived from the mixture of the tame sow which farrowed this creature; for I dissected another, which had neither white nor yellow bristles. Instead of the above-mentioned livery, the black colour, with which the *Siam* hog is farrowed, continues constantly the same. Most domestic swine are farrowed white, and the only alteration they undergo, is a yellowish tinge at the extremities of the bristles; and this appears deeper than it naturally is, from the animal's filthy habit of rolling itself in the dirt and mire. The bristles being laid on one another, occasions only the yellowish extremity to be seen; so that the creature appears to be rather yellowish than white. Many are brown, black, or spotted with these colours, with which they are farrowed. The longest bristles of tame hogs are about four or five inches. The end of the snout, the sides of the head, the parts round the ears, the throat, the belly,
the

the dock of the tail, &c. have very few bristles. That part of the hogs head, commonly called the snout, is formed by a flat round cartilage, having a small bone in the middle. In this cartilage are two apertures, which are the creature's nostrils. It is placed before the extremity of the upper jaw, projecting at the sides, and especially on the top, over the skin, which covers the end of this jaw; so that the circumference of the snout in a large wild boar, was nine inches seven lines; the cartilage alone projected ten lines above the skin of the face; but the circumference of the extremity of the upper jaw was only eight inches nine lines. The extremity of the lower jaw is under that of the upper, behind the lower part of the snout.

The head of a hog is long, the end of the snout slender in proportion to the bigness of the head, and the hinder part of the skull considerably raised. The eyes small, the ears large, the neck short and stout, the body thick, the rump slender, the tail small, and of a middling length, the legs short and strait, especially before.

The wild boar has a longer head; the lower part of the face more curvated; its tusks larger and sharper than those of other boars; and the tail short and strait. In the *Siam* hog,
the

the head is also longer and thicker, the eyes larger, and the ears smaller; the neck and fore-legs shorter; the feet larger, and the tail longer, and without any curvature; the forehead is high, and the back, like that of the wild boar, concave. The ears in the tame hog project forward, not standing erect as in the wild boar and the *Siam* hog. This difference is perceptible between the sounder, or young wild boar and the sucking pig: for even at this early age, the head of the tame hog is visibly less, the body more slender, and the tail longer than either in the *Siam* hog or wild boar. The tame hog has a much longer body than either the wild boar or *Siam* hog. Among the tame hogs the boars have a longer head, and the lower part of the forehead less sunk than those which have been castrated. These are the most sensible differences between the three known breeds of hogs. The following tables will exhibit the exact proportions of the bodies of these animals compared with one another.

The largeness of the head, together with the length and thickness of the snout, give it an air of stupidity, which is still more apparent in the tame hog, from the flapping of its ears forward, than in either the *Siam* hog
or

or wild boar, which keep their ears erect. The eyes are so small, and the face so destitute of lineaments, that the physiognomy would have no expression, were it not for the long tusks on the sides of the mouth. These by their form turn up the upper lip, and seem to be a mark of the creature's ferocity, as they are indeed its most formidable weapons. The body is as shapeless as the physiognomy is stupid: the neck so remarkably thick and short, that the head nearly touches the shoulders; and as this creature always carries it very low, no breast is to be seen. The fore-legs have so very little height, that the creature seems under a necessity of carrying his head low, to rest on its feet, and the whole body seems to be falling forwards. Accordingly, this animal, in all its motions, seems to be uneasy: it has so little suppleness in the joints of its legs, that it scarce bends them in moving forwards; and it never moves with any briskness or celerity but when forced. In the height of its fury, there is a heaviness in its air, and a stiffness in its motions. It strikes, kicks, lacerates with its tusks; but without the least address or agility; without even being able to lift its head, or to recover itself like most other animals.

Dimen-

Dimensions of the wild boar, the <i>Siam</i> boar, and the common boar.	Wild boar.		<i>Siam</i> boar.		Common boar.	
	Feet.	Inch. Lines.	Feet.	Inch. Lines.	Feet.	Inch. Lines.
Length of the entire body, measured in a right line, from the end of the snout to the anus	5	9 0	3	8 6	4	0 7
Height of the fore part	2	3 6	1	9 6	2	3 4
Height of the hinder part	2	6 3	1	9 0	2	5 8
Length of the head, from the end of the snout to the part between the ears	1	4 0	0	11 0	1	0 0
Circumference of the end of the snout	0	9 0	0	6 6	0	8 0
Circumference of the muzzle behind the snout	0	7 6	0	6 0	0	7 0
Circumference at the corners of the mouth	1	3 6	1	0 8	1	2 0
Circumference just below the eyes	2	0 0	1	6 0	1	2 0
Contour of the mouth	1	1 0	0	10 0	1	0 0
Distance between the nostrils	0	1 0	0	8 $\frac{1}{2}$ 0	0	10 0

Dimen-

Dimensions of the wild boar, the <i>Siam</i> boar, and the common boar.	Wild boar.		<i>Siam</i> boar.		Common boar.	
	Feet.	Inch. Lines.	Feet.	Inch. Lines.	Feet.	Inch. Lines.
Distance between the end of the snout and the anterior angle of the eye -	0	10 6	0	6 6	0	9 6
Distance between the posterior angle and the ears - - -	0	3 0	0	2 0	0	2 0
Length of the eye from one angle to the other - - -	0	1 3 6	0	1 1	0	0 11
Aperture of the eye - - -	0	0 6	0	0 5	0	0 4
Distance between the anterior angles of the eyes, according to the curve of the forehead - - -	0	5 0	0	3 0	0	4 3
The same measured in a right line - -	0	4 0	0	2 9	0	3 6
Circumference of the head between the eyes and the ears - - -	2	6 0	1	9 6	2	1 0
Length of the ears - - -	0	5 0	0	4 0	0	6 0

Dimen-

Length of the ears

Dimensions of the wild boar, the *Siam* boar, and the common boar.

Length on the base, measured along the

curve

Distance between the basfs of the ears

Length of the neck

Circumference behind the ears

Circumference before the shoulders

Circumference of the body behind the

fore legs

Circumference of the thickest part

Circumference before the hind legs

Height of the lower part of the belly

from the ground

Height under the breast

Length of the dock of the tail

Dimen.

OF THE HOG.

337

Wild boar.	Feet.	Inch.	Lines.	Siam boar.	Feet.	Inch.	Lines.	Common boar.	Feet.	Inch.	Lines.
	0	5	0	0	0	4		0	0	5	6
	0	4	6	0	0	2	10	0	0	4	6
	0	6	0	0	0	3	0	0	0	6	0
	2	7	0	1	1	11	0	2	2	3	0
	3	1	0	2	2	3	0	2	2	9	0
	3	6	6	2	10	0		3	3	6	0
	4	1	0	3	0	8		3	3	9	0
	3	3	0	2	7			3	3	0	0
	1	7	3	0	9	0		1	1	2	6
	1	3	4	0	7	8		1	1	1	0
	0	10	4	0	10	0		1	1	1	0

Dimensions of the wild boar, the Siam boar, and the common boar.	Wild boar.		Siam boar.		Common boar.	
	Feet.	Inch. Lines.	Feet.	Inch. Lines.	Feet.	Inch. Lines.
Circumference of the tail at its origin	0	4 3	0	2 6	0	3 3
Length of the arm below the elbow	0	9 6	0	6 10	0	9 0
Circumference of the thickest part	1	0 6	0	9 0	1	0 0
Bigness of the arm at the elbow	0	5 6	0	4 0	0	5 0
Thickness of the same part	0	3 8	0	1 10	0	2 4
Circumference of the carpus	0	6 8	0	5 8	0	7 0
Circumference of the metacarpus	0	6 0	0	5 0	0	6 0
Length from the carpus to the extremity of the hoofs	0	7 0	0	6 6	0	7 0
Length of the leg, from the knee to the heel	0	10 4	0	9 6	0	11 0
Circumference near the belly	1	8 0	0	10 4	1	4 6
Bigness at the heel	0	3 0	0	2 8	0	3 2
Circumference of the metatarsus	0	6 0	0	6 0	0	6 0

Dimen.

Dimensions of the wild boar, the <i>Siam</i> boar, and the common boar.		OF THE HOG.										339
		Wild boar.		<i>Siam</i> boar.		Common boar.						
		Feet.	Inch. Lines.	Feet.	Inch. Lines.	Feet.	Inch. Lines.	Feet.	Inch. Lines.	Feet.	Inch. Lines.	
Length from the heel to the end of the hoofs	-	1	0 0	0	8 6	0	11 0	0	11 0	0	11 0	0
Height of the hoofs	-	0	2 2	0	1 5	0	1 6	0	1 6	0	1 6	0
Length from the toe, to the hinder part of the hoof in the fore feet	-	0	2 3	0	1 7	0	1 10	0	1 10	0	1 10	0
Length ditto in the hind feet	-	0	2 0	0	1 10	0	1 8	0	1 8	0	1 8	0
Length from the toe to the hinder part of the feet	-	0	2 8	0	1 11	0	2 2	0	2 2	0	2 2	0
Breadth of the two hoofs jointly in the fore feet	-	0	2 3	0	1 8	0	1 10	0	1 10	0	1 10	0
Breadth ditto in the hind feet	-	0	2 0	0	0 5	0	0 6	0	0 6	0	0 6	0
Distance between the two hoofs	-	0	7 0	0	5 8	0	6 6	0	6 6	0	6 6	0
Circumference of the two hoofs jointly in the fore feet	-	0	7 0	0	5 8	0	6 6	0	6 6	0	6 6	0

Dimen.

Dimensions of the wild boar, the Siam boar, and the common boar.	Wild boar.		Siam boar.		Common boar.	
	Feet.	Inch. Lines.	Feet.	Inch. Lines.	Feet.	Inch. Lines.
Circumference of the two hoofs jointly in the hinder feet - - -	0	7 0	0	5 8	0	6 0
Circumference of the coronet in the fore feet - - -	0	6 6	0	5 6	0	6 0
Ditto in the hind feet - - -	0	5 6	0	4 10	0	5 4

F I N I S.



